

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

FEBRUARY, 1940

Volume 23 — Number 2

40 cents a copy — \$3.00 a year

Contents

SOME OBSERVATIONS ON BOEHLER'S TREATMENT OF FRACTURES. <i>B. S. Adams, M.D., Hibbing, Minnesota.....</i>	73	PRESIDENT'S LETTER	123
TUMORS OF THE NEUROMYO-ARTERIAL GLOMUS. <i>F. T. Becker, M.D., Duluth, Minnesota.....</i>	78	EDITORIAL: Sulfapyridine and Pneumonia.....	124
PERIODIC HYPERSOMNIA, HYPERTYREXIA, AND HUNGER, SECONDARY TO EPIDEMIC ENCEPHALITIS. <i>E. M. Hammes, M.D., Saint Paul, Minnesota....</i>	82	Virus Research and Animal Experimentation...	125
CARCINOMA OF THE CERVIX UTERI: FACTORS INFLUENCING PROGNOSIS. <i>Harry H. Bowing, M.D., Rochester, Minnesota..</i>	85	MEDICAL ECONOMICS: Medicine and Public Opinion.....	126
INHIBITION ILEUS. <i>E. A. Heiberg, M.D., F.A.C.S., Fergus Falls, Minnesota</i>	94	Seeing Eye to Eye with Lemke.....	126
EPISIOTOMY. <i>John T. Leland, M.D., Herman, Minnesota.....</i>	97	Unsuited to Minnesota.....	127
OCULAR TUBERCULOSIS—ITS SIMILARITY TO LEPROSY. <i>John J. Prendergast, M.D., Saint Paul, Minnesota</i>	98	"In Judgment"	127
CONVULSIONS IN CHILDREN WHILE UNDER GENERAL ANESTHESIA. <i>O. S. Wyatt, M.D., Minneapolis, Minnesota.....</i>	101	County Officers' Meeting.....	128
INFLAMMATORY DISEASE OF THE THYROID GLAND. <i>Thomas O. Young, M.D., F.A.C.S., Duluth, Minnesota</i>	105	Minnesota State Board of Medical Examiners..	129
NASAL OBSTRUCTION: IS IT ALLERGIC? <i>C. L. Oppegaard, M.D., F.A.C.S., Crookston, Minnesota</i>	112	OF GENERAL INTEREST.....	131
HISTORY OF MEDICINE IN MINNESOTA: History of Medicine in Hennepin County (Continued). <i>A. S. Hamilton, M.D.....</i>	116	IN MEMORIAM.....	132
CASE REPORT: Sulfapyridine in the Treatment of Staphylococcus Septicemia. <i>J. S. Blumenthal, M.D., Minneapolis, Minnesota..</i>	122	REPORTS AND ANNOUNCEMENTS.....	134
		WOMEN'S AUXILIARY.....	135
		PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE: Meeting of November 8, 1939.....	136
		Total Embolism of the Renal Artery and Primary Carcinoma of the Ureter. <i>F. E. B. Foley, M.D., Saint Paul.....</i>	136
		Genital Tuberculosis (Abstract). <i>Gilbert J. Thomas, M.D., Minneapolis.....</i>	137
		Meeting of December 13, 1939.....	139
		Hypotension, Like Anemia, Demands an Etiologic Search for Appropriate Therapy. <i>J. A. Lepak, M.D., Saint Paul.....</i>	139
		Lymphosarcoma of the Stomach and Bowel. <i>James A. Johnson, M.D., Minneapolis.....</i>	144
		BOOK REVIEWS.....	147

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1940

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

SUPERINTENDENT
Williametta G. Avery
Prescott, Wisconsin
Tel. 69

Radiation Therapy Institute

of Saint Paul

Housed in a special new addition to the

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including 1,200,000
Volt Constant Potential Installation of Most Advanced Design.

Edward Schons, M.D., Director J. P. Medelman, M.D., Associate Director

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 23

FEBRUARY, 1940

No. 2

SOME OBSERVATIONS ON BOEHLER'S TREATMENT OF FRACTURES*

B. S. ADAMS, M.D.

Hibbing, Minnesota

A YEAR and a half ago, I spent a month in Vienna, going there chiefly to observe the traumatic work of Professor Lorenz Bohler. I was especially interested in his methods of treating fractures of the vertebrae.

All of Bohler's work on fractures is based on his three cardinal principles: reduction, immobilization, and exercise of all joints not immobilized. Some have criticised Bohler for being over methodical, for using exactly the same treatment in every fracture, for not considering the differences in build, temperament, severity of injury, or any of the numerous other factors pertaining to the particular case, contending that he is working with a people so different from ours that the methods used by him would never do in this country. Bohler is a very systematic man. He has worked out a definite method for every kind of fracture and follows that quite closely; even the number of plaster bandages for each fracture is definitely in his plans. And he does follow his own method quite closely because he has found by much experience that his methods do work and that he gets good results with them. But if there are objections in any particular case to his usual method he will change to meet conditions as they exist, and when he finds that his usual method or plan can be improved he accepts the new. If a certain method is found to be giving unsatisfactory results he studies and ponders the problem until he devises a better plan. Bohler has a keen mind and a studious temperament and seems to be constantly watching his results, ever watchful for something better if what he is already using is

not giving the results he wants. In his work, Bohler is rather conservative, is usually deliberate, yet when occasion demands, he can operate rapidly and very skillfully. He does not seem to hurry but every movement seems planned and for some definite purpose; the same is true in his talking. Bohler speaks beautiful English, never using a needless word, but always choosing words that are very expressive and which definitely convey the idea he wishes to express. He is very kind to his patients and they seem fairly to worship him. He has the respect of his assistants; and the nurses and orderlies seem to have the highest regard for him. Yet he can be quite sharp and sarcastic at times.

When operating he does not remove his ordinary trousers or his white shirt that he always wears; he scrubs for operations very carefully, wears a face mask but no cap (he is entirely bald); he wears a sterile gown and rubber gloves and is meticulously careful in his technic; he always has a group of visiting surgeons around his table as closely as they can crowd and he seems to take pride in this, saying that he has never had any infection from this cause, rather deriding some Parisian and other centers where visitors have to watch from outside a windowed partition. Bohler does not believe in chemical disinfectants, very seldom uses iodine or other chemicals except soap and water, benzine and perhaps ether. His assistants often use iodine but quite sparingly; merthiolate and other disinfectants are too expensive for European clinics. He says he seldom has any infections following his operations, and I did not see any while I was there. In closing his wounds he

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minnesota, September 8, 1939.

almost always introduces, through a separate incision, a rubber drain tube which he removes in twenty-four hours. He is, however, very careful to stop all bleeding before closing an incision, as he says most wound infections are due to bleeding. In compound fractures, he says the skin wound is much more important than the bone injury. All wounds from injuries, trivial or severe, are thoroughly debrided, sutured with silk, and a rubber drain inserted, and complete rest required. For infections, his treatment is rest and elevation. He does not believe heat is of any particular value and seldom uses heat.

Three Cardinal Principles

Let us consider his three cardinal principles:

Reduction.—Boehler holds that the most important factor in reduction is to obtain good alignment without rotation. Alignment must be as perfect as possible and if 5 per cent or more out of alignment the bone is not reduced. He judges alignment by the center of the shaft. The fracture should be end to end, need not be exactly fitting, and if offset, it is of minor importance, but the alignment must be perfect. Shortening must be reduced to the minimum, and not over 1 cm. is allowable. Good alignment, end-to-end position, no angulation or rotation, and no shortening make for good reduction.

Immobilization.—Boehler says that complete uninterrupted immobilization from the time the bone is reduced until strong bone union takes place is absolutely necessary. Failure to accomplish this causes non-union. He favors immobilizing the bone too long rather than for too short a time. He does not believe immobilization of a joint results in a stiff joint; rather he believes motion started too early in a fracture involving a joint causes stiffness. He wants immobilization until the bone is strongly united whether it takes eight or ten weeks, or, for example in a leg, four or five months. About the only exceptions to this are in fractures of the upper humerus without displacement, shoulder and humeral fractures in old people, and motion of the arm in clavicle fractures. Except when in bed with traction he uses plaster of Paris almost exclusively for immobilizing. I saw no crutches and no wooden or artificial splints.

Airplane splints, made by his assistants, are

commonly used for fractures of the arm and for all upper arm cases. He prefers these made in his own hospital by his assistants because they fit more snugly into the axilla. Possibly expense is another factor. In many of his upper arm fractures, he uses plaster with the airplane plus traction.

Exercise.—Exercise of all joints not fixed in plaster is a very important procedure in the Boehler clinic. This means vigorous exercise regularly and frequently done—fifty times a day or more. A visit to his out-patient department as well as watching his patients in the hospital, shows a well laid-out system carried out thoroughly and systematically.

Methods of Treatment

To tell all my observations in a short paper such as this would be impossible. I wish to bring out a few of the high-lights of his methods, especially the things that impressed me most, and go into some detail regarding his treatment of back fractures.

Anesthesia.—Local injection of 2 per cent novocaine still seems to be his favorite anesthetic for most fractures. In some cases it seemed to work beautifully, but in his Colles' fractures the patients appeared to suffer a good deal of pain. He used spinal anesthesia in reducing the os calcis but local in all others that I observed. For more extensive operations, as an old fracture involving much joint dissection, ether was used.

Colles' Fracture.—Reduction is effected by a long strap attached to a hook on the wall, looped around the upper arm just above the elbow for countertraction. His assistant grasps the patient's thumb with one hand, and the second, third, and fourth fingers with his other hand. The fifth finger is not included because it might cause bowing of the hand. Strong traction is continued for at least five minutes. Then he makes very strong flexion of the wrist often until the fingers touch the forearm. Strong pressure is maintained over the dorsum at the fracture site, the hand is kept flat, and a molded plaster of Paris splint is applied along the dorsum of the hand and forearm from the base of the fingers to just above the elbow and lying more to the

radial side and molded carefully. A wet gauze bandage is wrapped around this; next a film is taken. If reduction is satisfactory the wet bandage is removed lest shrinkage cause pressure, and a dry gauze bandage is applied. Next day a volar plaster bandage is applied from a little above the finger base to elbow and a circular plaster bandage is applied allowing free motion of elbow and fingers. Anesthesia is local. Splinting is maintained for four weeks. In Colles' fractures he measures the length as well as the angle, watches alignment, and makes certain that wrist motion is free before applying the cast. Fractures of the forearm are reduced in a similar manner, also making dorsal pressure on the distal fragment with volar pressure proximally, pressing until it feels as though over-corrected. A plaster molded splint is applied from the top of the shoulder along the upper arm and down the dorsum of forearm on the radial side. A volar splint is then applied from the thumb to the elbow, the elbow being flexed to a right angle, the forearm being placed in midposition unless the fracture is in the upper third of the radius when it is supinated. Two small rods are then placed against the plaster to help keep the two bones separate—the dorsal rod being just above the wrist and the volar higher. A circular plaster bandage is then applied from thumb to axilla. The cast is retained for eight weeks. If the fracture is badly displaced he may use two Steinman pins, the upper being placed through the olecranon process and the cast, the lower pin through the bones of the wrist or of the metacarpals and through the cast. In all fractures of the forearm, it is placed in midposition except in those of the upper third of the radius, in which it is held in supination. Fractures of the head of the radius are fixed in plaster for three weeks unless badly displaced, in which case the head is removed. An olecranon, if not displaced, is fixed in flexion for three weeks; if displaced, he uses wire and fixes in flexion.

Upper Arm Fractures.—For all humerus fractures except those of the head of the bone in old people he uses an airplane splint made of Cramer wire. With this he uses a plaster molded splint on the outer surface of the upper arm carried around the elbow and down the forearm. A volar plaster splint to the elbow is added if necessary. If the fracture is hard to correct,

he uses screw traction to reduce, applies plaster splints and maintains traction by a traction rod on the end of the airplane splint. The airplane must fit snugly into the axilla to avoid angulation of the fracture. He uses starch bandages to hold the airplane in place and sews all bandages and straps securely. For fractures of the head of the humerus with no displacement he uses no retention apparatus and allows free motion in a sling after three days.

Ankle and Leg Fractures.—All ankle fractures having no displacement are put in plaster immediately. In applying the cast, the patient is seated on a table with the leg flexed at the knee and hanging over the edge of the table. The foot is supported on the doctor's knee with the foot flexed. A plaster molded splint extending from the tip of the toes on the plantar surface of the foot is carried up the back of the leg to the top of the fibula and molded carefully after cutting for heel corners. Three circular plaster bandages are used, each starting at the top and continued down to the end of the toes, but cut away on the dorsal surface to allow full dorsiflexion of toes. The cast is maintained from four to six weeks. If the fracture is severe and displaced, with rupture of lateral ligaments, the cast is kept on from ten to twelve weeks. In fractures of both malleoli with eversion (usual type) he makes very strong pressure on the lateral side of the ankle and applies a cast which must be retained for ten weeks. If the ankle is inverted, reduction must be done very early and even then results are apt to be poor. If severe, screw traction may be needed. These are serious fractures. If a small piece, only two or three mm. wide is broken off the posterior surface of the tibia, no special treatment may be needed, but if a large piece such as a third of the surface is broken off, he applies screw traction on a Braun frame. Boehler says a fracture of the upper end of the fibula accompanied by a slight fracture of the posterior distal end of the tibia with a torn internal ligament makes a serious fracture and requires a plaster cast for ten weeks. These are easy to miss. Fractures of the anterior surface of the distal end of the tibia, he places in a cast with the foot in plantar flexion for six to ten weeks. Fractures of the leg above the ankle, without much displacement, are put in a plaster cast extending up the thigh

with the knee flexed slightly. If badly displaced, he uses screw traction extension, followed by a cast, using a Steinman pin through the os calcis. The leg is then placed on a Braun frame with a two-kilo weight traction for four weeks. After that he removes the pin and applies a plaster cast with a walking heel.

Femur Fractures.—Boehler's first treatment for all fractures of the femur, regardless of location, is extension by means of a two millimeter Steinman pin through the upper end of the tibia. If traction is needed longer than three weeks, as in fractures of the shaft, the pin is removed from the tibia and inserted through the lower end of the femur. His reasons are that a pin through the lower end of the femur early may infect a hematoma in the thigh, traction of the tibia longer than three weeks may loosen the knee. With traction, he places the leg on a Braun frame. For a pertrochanteric fracture, he uses pin traction for three weeks followed by skin traction using Unna paste. Later he divides the traction weight equally between the thigh and the foot; he always uses one-seventh body weight for leg extension. If coxa valga develops from extension, he lessens the weight. He uses some abduction but does not stress this. Shaft fractures are in pin traction through the upper tibia for three weeks followed by pin traction through the lower femur. The same treatment is used for fractures above the condyle. In all of these the foot of the bed is elevated, a Braun frame is fastened to the end of the bed, a box placed for the good foot to brace against, and rotation is regulated by a cord from the end of the pin to the overhead rod. No knee motion is allowed while a pin is in the bone. After the union is strong, he removes traction, uses Unna paste from toes to groin, allows knee flexion and, when sufficiently strong, allows hip motion.

Fractures of the Vertebrae.—Of all Boehler's work, his methods and treatment of broken backs seemed the most outstanding and spectacular. The results he obtains are truly marvelous, especially in some cases with marked paralysis. His patients seemed so very comfortable in spite of huge and ungainly looking casts and exercise is started so early it is hard to believe they have suffered a serious injury. At the time I was there, Boehler had twelve or thirteen broken

backs in his hospital, several coming in while I was there and others leaving. All were walking and taking vigorous exercise except one who was permanently paralyzed, and who had not come to Boehler until two weeks after his accident. It was most interesting to watch the development in these cases during the four weeks I was able to observe them; first walking very carefully and feebly, gradually increasing exercises until they were able to take very vigorous movements and carry heavy weights on their heads. Boehler claims his patients come out of their casts with a stronger and more supple back than they had before the accident. Of fifty cases, he told me all were working and without compensation except one man who was over sixty years of age. That his cases are really fractures is proven by the films.

Hyperextension in a cast is the method used by Boehler in all cases. If any lateral displacement is present this must be reduced first. He does this by strong extension, one assistant pulling on the legs and another pulling against this on the head and shoulders; then manipulation at the site of the displacement to obtain reduction. Hyperextension must be marked and extreme and the patient held in a body cast from three to nine or ten months according to the severity and amount of displacement and compression. This should be done just as soon as the patient is brought in and if any paralysis is present it must be done at once as pressure on the nerves is the cause of paralysis in most of these cases. If this pressure is not quickly released permanent nerve injury follows and paralysis will be permanent. Boehler says the only hope of these paralyzed cases is immediate reduction by hyperextension. With hyperextension he expects a good result with freedom from paralysis in most of his cases, and even in cervical fractures in 50 per cent or more of the cases. His method is to suspend the patient's trunk on a strap four inches wide for a sufficiently long time to overcome the deformity and, if a compression fracture, for the compression to unfold or widen out. This may take from one to several hours and during this time repeated lateral films are taken to watch the results. The only anesthetic used is local with morphine, and in some not even local is used. It seemed a trying procedure for the patient, tiring, though not especially painful. Then a plaster of Paris body cast is applied from

the groin to the axilla. He uses ten plaster bandages each five meters long by twenty centimeters wide. Pads of felt are applied over the iliac crests and over the point of lordosis or fracture, and a stockinette is drawn over all, no other padding being used. Trimming after setting of the plaster consists of a small opening in back at the point of the lordosis, a large opening over the abdomen, axillary openings for free motion of the arms, and similarly in the groins for free and full extension and flexion of the thighs. Pressure is necessary at three points: in front at the top of the sternum, over the pubic bones, and behind at the point of fracture—a three point pressure. In applying the cast he gets more marked hyperextension if the patient lies on his back on the strap. All fractures of the dorsal spine are placed with the patient lying on his back. Ordinary lumbar fractures may be reduced with the patient prone, but if severe or complicated he must lie on his back. If the cast is to be applied with the patient lying on his abdomen, the suspending strap is placed under the chest at the armpits; if on the back, it is placed under the site of the fracture, the best place being under the twelfth dorsal vertebra.

The procedure in reducing and immobilizing fracture of the vertebra is as follows: The patient lies prone upon a table with sandbags under the ankles and under the thighs. The legs and thighs are strapped to the table and the patient lies so that the pubes are at the end of the table when the end is dropped. A four inch wide strap (webbing) is placed under the axillæ, which have been well padded, this suspending strap being enclosed in a long cellophane envelope so it can be pulled out after cast has been applied. The suspending strap is fastened to an iron rod about two feet long and this is raised by a rope through a pulley on the ceiling. The patient is raised by this, with arms extended above his head and resting on a table that is also raised. His body is now supported by his thighs on the table and the strap under the axillæ, allowing the trunk to sag. After waiting about an hour, if lateral films show the compression to be satisfactorily reduced, the body cast is applied from axilla to groin, ten plaster bandages being used and molded very carefully and applied very evenly, special care being taken to apply this cast snugly against the upper ster-

num, against the pubic bone, and in the back against the padded fracture site. After the cast is hard and strong, the patient is let down, the suspension strap is pulled out of its cellophane envelope (this is impossible without the cellophane), the strap openings are closed with plaster bandage and the cast is trimmed to allow full arm and thigh motion. An opening is made over the abdomen, and one in the back at the point of fracture. The patient is encouraged to get out of bed the next day and to start walking at once, or at least in a few days. Most of Boehler's patients were taking very vigorous bending exercises in less than a month. The procedure when the patient lies on his back is similar, the cellophane-enveloped strap being located under the site of the fracture.

Fractures of the Upper Dorsal and Cervical Vertebrae.—Extension is required in addition to hyperextension. The patient is put in hyperextension lying on his back with strap in the axillæ. A Gleason head strap is attached. One assistant does nothing but hold the head. A scale is attached to the arch holding the head with a pull of from 15 to 30 kilos, and the extension is made a little downward as well as longitudinally. The cast is applied, extending in fractures of the dorsal spine to the pubes. The cast for fracture of the cervical spine should extend to the lower end of the sternum, the higher fractures requiring the cast to be extended higher on the neck and head. A cervical spine fracture requires the extension of the cast up the neck onto the back of the head and up onto the chin with the head and neck hyperextended, the face being directed toward the ceiling.

In cases with paralysis, it is very important to reduce vertebral fractures immediately. Many cases of paralysis are due to pressure on the intervertebral nerves and not to the accident itself. In these, if reduction is done within a few hours, recovery will be complete, but if left and not reduced early, nerve injury will follow in a very short time from pressure on the nerves and the damage will be permanent.

Boehler starts his patients walking after fractures of the vertebrae as soon as possible. If there is no paralysis this is instituted in one to three days. Exercises are increased as rapidly as possible. Most patients take vigorous exer-

cises in about three weeks, such as bending, standing on one leg and swinging the other, full arm motions, and carrying weights on the head. In from two to three months, his patients are carrying from 30 to 40 kilo on their heads. One of Boehler's favorite exercises is for his patients when convalescing, but while still in casts in the hospital, to lie across the bed with the trunk and

cast part extending beyond the edge of the bed while the assistant holds the feet down on the bed. They then raise and lower the upper end of the body, which is extended beyond the bed, as fully as possible. This exercise is repeated daily. Boehler says his patients recover with a back stronger and more limber than it was before the accident.

TUMORS OF THE NEUROMYO-ARTERIAL GLOMUS*

F. T. BECKER, M.D.†

Duluth, Minnesota

GLOMUS tumors are of extreme interest because, notwithstanding their small and insignificant size, they are able to produce severe pain and agony to the afflicted patient. These growths vary from a pin head to hazel nut in size and are a benign hypertrophy of existing arterial-venous anastomoses. As these anastomoses are more frequent on the extremities, especially the fingers, and nail beds, the tumors are therefore more prevalent in these areas. They appear as slight bluish-red elevations on the skin and the most diagnostic feature is the agonizing pain which the patient feels on the slightest pressure. When these growths are subungual, they are not always visible. The diagnosis can only be made by the extreme pain manifested by pressure on the nail. Occasionally a slight bluish discoloration may be noticed under the nail, or if the tumor has been present for a sufficient time a roentgenogram of the finger may show some erosion of the phalanx. It is my purpose in this paper to describe two typical cases of this condition, and briefly review the normal physiology and histology of these tumors.

A Review of the Literature

There have been so many excellent reviews of this subject published in the American literature during the past few years that it is superfluous to give a detailed discussion. These peculiar tumors have been described by numerous authors³ during the past fifty years under various names

such as "angiosarcoma," and "painful subcutaneous tubercles." It remained, however, for Barré² to clearly outline the clinical manifestations and to establish that surgical excision was curative. These specimens were studied by Masson,⁹ who described their histologic characteristics and also showed that they were benign overgrowths of an arteriovenous anastomosis which are present normally in the stratum reticulare of the cutis. Recent reviews of this subject and reports of cases have been made by Bailey,¹ Freudenthal,⁴ Stout,¹² and Lewis and Geschickter.⁷ Radasch¹¹ in a recent review of the literature was able to find reports of ninety cases, four of which were instances of multiple tumors.

Normal Histology and Physiology

It was Masson who first proved that the glomus exists normally in the subcutaneous tissue and that glomal tumors result from hypertrophy. Sucquet¹³ first described arterio-venous shunts which he found by making special injections into arteries of material which he noticed went directly into the veins without entering any capillaries. Later Hoyer⁵ described and demonstrated similar anastomoses in animals. Popoff¹⁰ has recently made an extensive study of these vascular anastomoses both in normal and pathological conditions. He found that they were more numerous in the nail beds, tips of fingers, palms and soles than any other part of the body.

A glomus consists of various parts, first the afferent arteriole, which is a small branch of the subcutaneous artery. This arteriole gives off sev-

*From the Division of Dermatology of the University of Minnesota, H. E. Michelson, M.D., Director, and the Minneapolis General Hospital, S. E. Sweitzer, M.D., Chief of Service.
†Dr. Becker is with the Duluth Clinic, Duluth, Minnesota.

GLOMUS TUMORS—BECKER

eral smaller branches which supply nutrition to the reticular and supporting tissue of the glomus. The arteriole then leads directly into the anastomotic vessel (Sucquet-Hoyer canal), which now becomes considerably modified (Figs. 1 and

consisting of delicate collagenous fibres and peripheral to this is a denser lamellated collagenous tissue which forms an irregular capsule around the glomus and it is in the meshes of this tissue that the collecting veins are found.

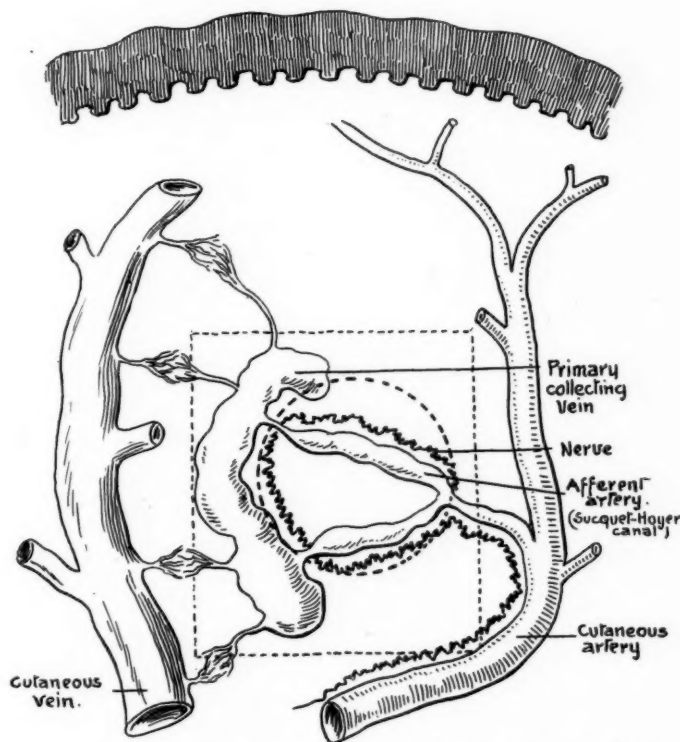


Fig. 1. Schema of normal glomus. The portion in the dotted square is the glomus proper and the portion in the dotted circle is enlarged in Figure 2. Reproduced by courtesy of Doctors Fred Weidman and Fred Wise.

2). Its course is very tortuous or "S"-shaped; the endothelial cells are cuboidal, increased in size, and two or three rows thick. The internal elastic lamina is lost and the muscular coat consists of an indistinct inner longitudinal and outer circular layer. Amid the muscle cells are large clear epitheloid cells or so-called glomus cells. The outer zone consists of a loose collagenous reticulum, in the meshes of which are found numerous non-medullated nerves. Around the canals like a plexus are the collecting veins into which they empty; these veins are thin walled and poor in muscular tissue. They in turn empty into subcapillary venous plexus and thence into the deeper veins. Around the vessels is an area

Popoff found the glomus entirely lacking at birth but that it begins to develop rapidly post-natally, undergoing atrophy around sixty years of age. The anastomoses act both locally and generally in the regulation of heat. If a local area is cold, the glomus diverts blood from the capillaries to its collecting veins, which have a large surface area. Generally they may aid in conserving or lowering the body heat as above. When the body temperature is elevated the glomus rushes blood to the surface veins for cooling and when the body temperature is low it diverts the blood from the surface to conserve its heat. The glomus also aids in regulating the flow of blood through an extremity by either allow-

ing it to fill the capillary bed or by diverting it into the collecting veins, where it is rapidly placed back in the general circulation. Since the glomus is absent in the premature baby, it is rather convincing evidence that it is probably a great factor

give origin to the smooth muscle elements of the glomus; others think they are angioblasts giving rise to blood vessels of the growth. Stout was able to demonstrate, in his histologic sections, areas around blood vessels where the glomus

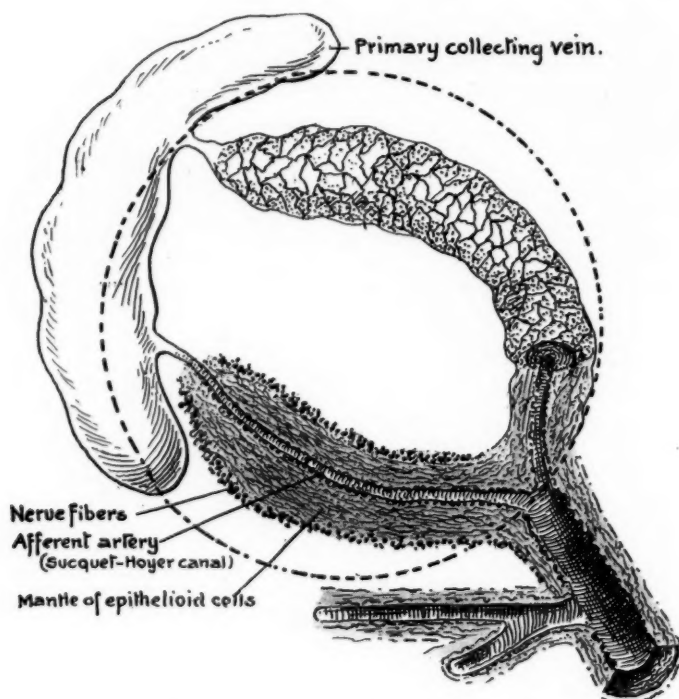


Fig. 2. Enlarged portion of the glomus illustrated in Figure 1.

in controlling local and body heat. Masson believed that the glomus aided in tactile sense by its ability to regulate vascular pressures and thereby interstitial pressures. He believed that was the reason why they were so plentiful in the areas in which the tactile sense was best developed, namely the finger tips. Popoff also found that the normal glomus was increased in number in arteriosclerosis and in extremities in which gangrene associated with diabetes was developing.

The glomal tumor represents a benign hyperplasia of all of the elements contained in the normal glomus, especially the so-called epithelioid cells. These cells are peculiar and closely resemble the cells of the glomus coccygeum.¹² They are undoubtedly mesoblastic in origin. Some authors believe they are myoblasts and

cells were transforming into smooth muscle cells.

Mason and Weil⁸ found that the distribution of the tumors as to sex was about equal and that they occurred from eight to eighty-two years of age. In reviewing thirty-four cases they found twenty-one were on the upper extremities and two-thirds of these were subungual. The lesions are also more frequent among Jews, who are more prone to develop disturbances of the sympathetic innervation of the extremities.

Report of Cases

Case 1.—Mrs. L. T., a forty-five-year-old white woman of Scandinavian descent, consulted the University Hospital Staff because of recurrent attacks of upper right quadrant pain which was interpreted by the Surgical Department as cholelithiasis. She was seen in consultation by the Dermatology Staff because of a

GLOMUS TUMORS—BECKER

painful tumor on the right forearm that had been present for ten years or more. With the slightest touch or exposure to cold air she would feel paroxysms of severe pain which would shoot up and down her arm.

these patients on the slightest pressure, or even changes in temperature, special studies were performed to demonstrate nerve fibers. At the suggestion of Dr. A. T. Rasmussen one half of the tissue which was removed from the first patient was fixed in absolute alcohol, to

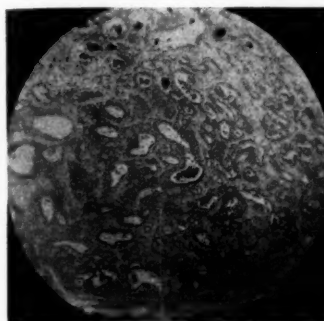


Fig. 3. Section of glomus tumor under low power magnification showing numerous vascular spaces which are surrounded by a mantle of epitheloid-like cells.

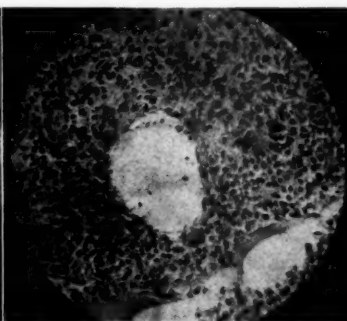


Figure 4. High power magnification of one of the vascular spaces as shown in Figure 3. The lining endothelium may be seen and the epitheloid (glomus) cells in detail.

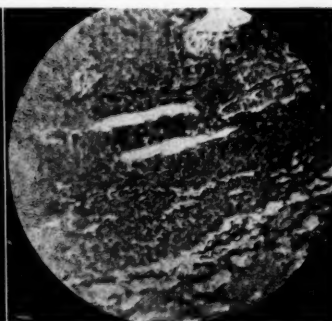


Fig. 5. High power magnification of area similar to Figure 4, showing nerve fibers among glomus cells and in supporting tissue.

Examination of her skin revealed a semi-solid bluish red tumor about the size of the head of a lead pencil located on the dorsal surface of the right forearm. With the slightest pressure on the lesion, the patient experienced excruciating pain. The lesion was completely excised under local anesthesia. The tumor was divided in half, one portion being fixed in 70 per cent alcohol, then blocked in paraffin, sectioned and stained with hematoxylin and eosin.

Microscopic examination under low power objective showed the tumor to be encapsulated by connective tissue. The central portion consisted of numerous vascular spaces, lined by large cuboidal endothelial cells (Figs. 3 and 4). Next to these were large polyhedral cells with an acidophilic cytoplasm and a dark staining nucleus. These cells varied in thickness from three to four around some blood channels to ten or twelve around others, and are those described as epitheloid or glomus cells. Interspersed between and among the cells were collagenous fibers as a supportive structure. The diagnosis of the histologic section was that of a "glomus tumor."

Case 2.—Mr. A. M., fifty-eight years of age, consulted Dr. L. A. Whitesell because of a small painful growth on the medial aspect of the left knee. The growth was so painful that he devised a protective bunion pad to remove garment pressure.

Examination of his skin showed a small slightly elevated bluish red nodule measuring two by three centimeters, located over the medial aspect of the head of the left tibia. The tumor mass was completely excised under local novocaine infiltration anesthesia. Histologic examination of the tumor tissue was similar to that described in Case 1 and the diagnosis was "glomus tumor."

Because of the excruciating pain that is elicited by

which six drops of ammonium hydrate per 100 c.c. were added. The tissue was stained by Cajal pyridine silver stain of Dr. Larsell⁶ and then imbedded in paraffin and sectioned. Microscopic examination of this tissue after staining by this special technic showed numerous nerve fibers entering through the capsule and spreading out into the reticular tissue, where they seemed to terminate about the glomus cell (Fig. 5).

Comment

The two cases reported are typical of an unusual neurovascular tumor which has created intense interest in the literature of recent years. These lesions are clinically very important, primarily because of the excruciating pain which they produce. The frequent occurrence of these growths below the finger nails makes the diagnosis less obvious, but careful examination will usually show discoloration of the nail in a small area and occasionally erosion of the terminal phalanx may be seen on roentgen examination. A rich supply of nerve fibers terminates about the epitheloid-like cells that are present around the vascular spaces. It would seem apparent then that changes in tension within the vascular spaces would account for the severe pain that occurs in these tumors. The lesions are cured by simple surgical excision and do not respond to any type of radiation therapy. Histologic examination will readily confirm the diagnosis. In approximately a hundred cases now reported in the

literature, no evidence of malignancy has been found.

Summary

Two typical cases of glomus tumors have been described. The histology and physiology of these benign growths have been discussed, especially the rich supply of nerve fibers which apparently innervates the vascular spaces. These nerves probably account for the characteristic pain present on the slightest manipulation. Surgical excision is usually curative.

Bibliography

1. Bailey, O. T.: Cutaneous glomus and its tumors. *Am. Jour. Path.*, 11:915, 1935.

2. Barré, J. A.: Troubles sympathiques étendus et violents du membre supérieur par tumeur du doigt, Guérison. *Rev. Neurol.*, 34:942, 1920.
3. Chandelux, A.: Recherches histologiques sur les tubercles souscutanés douloureux. *Arch. de Physiol. Norm. et Path.*, 9:2:639, 1882.
4. Freudenthal, W.: The glomus and glomus tumors. *Brit. Jour. Derm. and Syph.*, 49:151, 1937.
5. Hoyer, H.: Denkschr. d. Warschauer M. Gesselsch. Jahrb. 1873, 51 (*Arch. f. Mikr. Anat.*, 13:603, 1877).
6. Larsell, Olaf: *Jour. Comp. Neur.*, 63:1:97, 1935; also recommended by Rasmussen, A. T., *Endocrinology*, 23:2:260, 1938.
7. Lewis, Dean, and Geschickter, C. F.: Glomus tumors, *Jour. A.M.A.*, 105:775, 1935.
8. Mason, M. D., and Weil, A.: Tumor of a subcutaneous glomus. *Surg., Gyn. and Obst.*, 58:807, 1934.
9. Masson, P.: Le Glomus Neuromyo-Artériel des régions tactile et ses tumeurs. *Lyon. Chir.*, 21:257, 1924.
10. Popoff, N. W.: Digital vascular system. *Arch. Path.*, 18:295, 1934.
11. Radasch, H. E.: Glomus tumors. *Arch. Path.*, 23:615, 1937.
12. Stout, A. P.: Tumors of the Neuromyo-Arterial Glomus. *Am. Jour. Cancer*, 24:2:255, 1935.
13. Sucquet, J. P.: D'une circulation dérivative dans les membres et la tête chez l'homme. *Bull. Acad. Roy. de Med. de Belgique*, 26:825, 1860.

PERIODIC HYPERSOMNIA, HYPERPYREXIA, AND HUNGER, SECONDARY TO EPIDEMIC ENCEPHALITIS*

E. M. HAMMES, M.D.

Saint Paul, Minnesota

FULTON⁸ in his recent textbook, "Physiology of the Nervous System," states that five distinct syndromes of the hypothalamus can be recognized. In some instances these syndromes may occur fairly well isolated; in others evidence of the entire group may manifest itself, depending on the location and extent of the lesion and the rapidity of its development. These syndromes may be designated as (1) hyperthermia, (2) diabetes insipidus and emaciation, (3) the adiposogenital syndrome, (4) hypersomnia with disturbed thermal regulation, and (5) autonomic epilepsy.

In association with these syndromes, personality changes and other psychic manifestations may present themselves, varying from simple depression to any of the major psychoses. Periods of excitement tend to develop from lesions of the anterior hypothalamus, while depressed¹³ lethargic, and even catatonic states may be produced by posterior lesions.

Many cases of hyperthermia and hypothermia associated with lesions in the hypothalamus are recorded in the literature. The combination of hypersomnia with hyperthermia occurring at irregular but quite frequent intervals over a period of over four years, with periods of hunger,

is of sufficient interest to warrant this report. Although no pathologic studies are available at the present time, the clinical manifestations are quite typical of a hypothalamic syndrome.

Report of Case

Attack of epidemic encephalitis: aphasia for two years; recurrent attacks of hypersomnia and hyperthermia developing soon after encephalitis; periods of persistent hunger.

The patient, a boy four years and nine months of age, was referred to us by Dr. E. J. Fogelberg on December 8, 1937. (Now aged five years, six months.)

Family history was negative except that the father had migraine for many years.

The patient was a cesarean section delivery at eight and a half months. He developed normally, walked at ten months, and was able to talk some at the time of the onset of the encephalitis at the age of sixteen months. During his first year he had chicken-pox and measles without any complications. He is right-handed. At sixteen months of age, in July, 1934, he developed encephalitis, with two generalized convulsions during the first twenty-four hours. His temperature varied between 100 and 105 degrees F. Following the convulsions he apparently slept for about twenty hours. He gradually recovered but remained aphasic until the winter of 1936, when he began to say a few words. His vocabulary gradually increased and his speech is quite normal at present. During the entire period his vesical functions were normal. He expressed his wants by pointing to what he desired.

About one month after he recovered from his en-

*Read at the meeting of the Central Neuropsychiatric Association, Minneapolis-Saint Paul, Minnesota, October 8, 1938.

HYPERMOMNIA, HYPERPYREXIA AND HUNGER—HAMMES

cephalitis, in August, 1934, he would have attacks of gradually becoming sleepy, and after a short period would fall into what appeared a deep normal sleep. He would sleep from twenty-four to seventy-two hours, then awaken, would dress himself, appear normal, and go out and play with other children. During these attacks of hypersomnia he could be aroused, would take a little food and again fall asleep while eating. There have been no involuntaries. On several occasions he would awaken, urinate, and be asleep before he had completely emptied his bladder. During the attack he lies quietly and relaxed, except on five occasions, when his right arm was restless and he would move it about, but there were no convulsive jerkings. He has slept continuously for forty-eight hours without taking food or drink, or urinating.

He may have prodromal symptoms, such as an occasional occipital headache or a feeling of drowsiness for about fifteen minutes before falling asleep. He realizes that an attack is coming on and does his utmost to keep awake. Before an attack he frequently tells his mother, "I am so sleepy I cannot stay awake," and then begs her repeatedly to remain with him if he should fall asleep. He sits down, is very quiet, and within a few minutes is sound asleep. These attacks occur at irregular intervals, averaging about two a month. He has fallen asleep on the railroad track, on the highway, in the field, on the playground, and at home. The mother estimates that he has had over one hundred of these during the past four years. His last attack occurred on August 21, 1938, was of fifty hours' duration, and was accompanied by a hyperthermia of 104 degrees F.

His temperature, which has been noted daily for over three years, has been normal except during the periods of hypersomnia. About one-half hour before the hypersomnia manifested itself he would develop a temperature of about 100 degrees F. From three to four hours after he has fallen asleep the temperature would reach its maximum, 103 to 105 degrees. It would continue at this level until he began to awaken and then rapidly return to normal. Cold water enemas and cold baths would reduce the temperature about two degrees, without any appreciable effect on the hypersomnia. His pulse averaged about 130 and respirations 26 per minute during the attack. They were not accompanied by sweating or any evidence of vasomotor reactions. The attacks of hypersomnia and hyperthermia always accompanied each other and have never occurred separately. They have continued since the onset without any special variation in their frequency or severity.

During the past year, since September, 1937, he has had periods of about twelve hours' duration during which time he would continuously beg for food. The mother stated that he has had about twenty of these attacks. She describes them as "mental hunger." He would eat a good meal and within a few minutes insist that he was so hungry and wanted food. When the food was given to him, he refused to eat because he said that he felt so "full." Within a short interval

he would repeat the same request. This would continue during the entire day until he finally fell asleep. Upon awakening the following morning his food hunger had disappeared. The last one occurred seven days ago. During these periods his food and fluid intake were normal. These attacks bore no relation to the hypersomnia and hyperthermia, and never occurred during or immediately before or after the hypersomnia.

His urinary output has been normal. There has been no evidence of polyuria or polydipsia. He has not manifested any personality changes or temper tantrums. He plays normally with his toys and with other children and is anxious to begin school. He has an occasional period when his memory seems slightly impaired, but the greater part of the time he is alert and remembers well. His nocturnal sleep is normal. He has had no petit mal attacks or convulsive seizures since the encephalitis.

Physical examination reveals a well nourished, well developed male, weighing 48 pounds. Complete examination, including the sexual organs, showed no abnormality.

The neurological examination was also negative throughout. Pupils, fundi, eye movements, other cranial nerves, reflexes, sensation, and so forth, were negative. Mentally he was alert, answered questions fairly well and executed the various tests promptly and correctly. His memory was normal.

His temperature was 98.6 degrees F., pulse 84, taken at 3 p. m. yesterday; hemoglobin 82 per cent; red blood cells 4,700,000; leukocytes 8,400; differential count normal; blood pressure, systolic 96, diastolic 45; blood Wassermann negative. The spinal fluid on December 9, 1937, was clear and colorless, under pressure of 220 mm. of water. It contained one cell, a trace of globulin, and the Wassermann negative and the colloidal gold curve normal. The quantitative sugar and quantitative protein were within normal limits. Roentgenological studies of the skull, sella tursica, and chest were normal. No encephalograms were made. Basal metabolic rate was +2 per cent.

The sugar tolerance test gave the following values for blood sugar: after fasting, 70 mg. per 100 c.c.; one-half hour after ingestion of 100 gm. of dextrose, 98 mg; one hour, 78 mg, and two hours, 69 mg. The water balance was normal.

He had had a tonsillectomy at the age of thirty months and has been given benzedrine, without any noticeable effect on his attacks.

Masten¹² observed a somewhat similar case.

In December, 1935, a girl of seven had an attack of illness, manifested by sleepiness, headache, earache, sore throat, and abdominal pain. Within one week she complained of weakness of both legs and soon after could not stand. The acute illness continued for ten days with fever of 104.4 degrees rectally. The legs remained weak until July, 1936, when strength returned suddenly. In September, 1936, she had a period of deep sleep of twelve hours' duration, and similar at-

tacks in the fall and winter of 1937. Upon awakening she screamed and held her head. Occasionally she sobbed continuously for two or three days, her only reason given for crying being that she was tired. During these days she was very irritable. The day following her attacks of hypersomnia she ran a high temperature. She had also been manifesting some personality changes. Formerly she was an active, keen youngster. Since her illness she had become quiet, taking no part or interest in the activities of her brothers and sisters and preferring to sit and rock with a doll in her lap.

Comment

Our case is of interest because of the isolated syndromes of recurrent attacks of hypersomnia and hyperthermia, extending over a period of four years. Lethargic encephalitis frequently produces lesions in the hypothalamus. Eaves and Croll⁶ have found this region invariably involved in encephalitis, and more extensively than any other portion of the brain except the substantia nigra. Disturbances in the sleep rhythm and the presence of a sleep center in this region were described by von Economo⁵ in 1930. Later clinical and experimental evidence indicate that the posterior group of the hypothalamic nuclei, including the mamillary body and the nucleus hypothalamicus posterior, are involved. According to Hess, stimulation of this region with a faradic current induces hypersomnia. Ranson,¹⁵ however, has never been able to produce sleep by faradic stimulation of the hypothalamus, but all the reactions were those that accompany emotional excitement. Fulton and Bailey⁹ also reported cases of expanding tumors in this region associated with pathologic sleep. Bailey⁹ has further observed that manipulation of the posterior hypothalamus and central gray of the Sylvian aqueduct causes loss of consciousness, which is not so prone to occur if the anterior hypothalamus is irritated.

The importance of the hypothalamus for the regulation of body temperature has been reviewed repeatedly in the literature. Frazier, Alpers, and Levy⁷ have conclusively demonstrated that mesially placed bilateral lesions in the floor of the third ventricle in cats produce complete loss of temperature control, resulting in a sustained hypothermia. The lesion involved the floor of the third ventricle corresponding to the nucleus hypothalamicus anterior in cats and the substantia grisea in man. In no instances were

they able to produce hyperthermia by lesions placed in the hypothalamus. Alpers,⁷ however, reported two cases of tumor in the pituitary area in which death was accompanied by severe hyperthermia. The lesions were found in the floor of the third ventricle, more particularly in the substantia grisea. Jacoby and Rohmer observed that severe and prolonged hyperthermia could be produced by the introduction of mercury into the ventricular system, especially into the infundibular region. Cushing in his Lister Memorial lecture stated that complete emptying of the ventricles of the brain in children has been followed by hyperthermia. Ranson and his coworkers¹⁴ in their experiments on monkeys have demonstrated that postoperative hyperthermia develops when bilateral lesions are made in the lateral part of the rostral portion of the hypothalamus. Hypothermia develops when the bilateral lesions are situated dorsolateral to the rostral part of the mammillary bodies. The hyperthermia is usually transient and of about twenty-four hours' duration, while the hypothermia may continue for days, even as long as a month.

Davidson and Selby⁴ reported a case of adiposogenital dystrophy with hypersomnia and hypothermia. During a period of over three months, the average temperature was about 92.5 degrees F. Postmortem studies revealed an angioma situated in the floor of the third ventricle. The prolonged hypothermia was evidently due to an extensive involvement of the tuber nuclei and the mammillary bodies. Davidson and Friedman³ reported the case of a twenty-nine-day old infant who during its life time manifested constant fluctuations of hypo- and hyperthermia which tended to approximate the environmental temperature. Pathologic studies revealed that most of the hypothalamic nuclei, especially the mesial group, were destroyed by an infiltrating neuroblastoma. Fulton⁸ states that in man usually both mechanisms of heat loss and heat production are disturbed because most lesions tend to involve both groups of nuclei simultaneously, due to the antero-posterior narrowing of the hypothalamic area in man.

The complaint of periods of continued hunger presents another interesting phase in our case. Beattie² and others have shown that stimulation of the mid-line nuclei in the region of the tuber evoke increased peristalsis of the stomach and

CARCINOMA OF THE CERVIX UTERI—BOWING

intestines, along with other phenomena, indicating a sympathetic outflow.

Levin,¹¹ under the title of "Periodic Somnolence and Morbid Hunger," reviewed ten cases from the literature, including one of his own. No pathologic findings were recorded. His hypothesis is that "periodic somnolence hunger" is due to excessive "inhibitability" or exhaustibility of the highest cerebral centers, particularly the highest motor centers. He bases this opinion on the results Fulton¹⁰ and his coworkers obtained after bilateral removal of parts of the frontal lobes in monkeys. The excision of these areas produced increased appetite, gastro-intestinal motility, and frequently intussusception. Hyperpyrexia, however, was not an accompaniment.

1125 Lowry Medical Arts Building.

References

1. Alpers, B. J.: Hyperthermia due to lesions in the hypothalamus. *Arch. Neurol. and Psychiat.*, 35:30-42, (Jan.) 1936.
2. Beattie, J., Brow, G. R., and Long, C. N.: Physiological and anatomical evidence for existence of nerve tracts connecting hypothalamus with spinal sympathetic centers: a research. *Proc. Assn. Research Nerv. and Ment. Dis.*, 9:249, 1930.
3. Davidson, C., and Friedman, E. D.: Poikilothermia with hypothalamic lesions. *Arch. Neurol. and Psychiat.*, 38: 1271-1281, (Dec.) 1937.
4. Davidson, C., and Selby, N. E.: Hypothermia in cases of hypothalamic lesions. *Arch. Neurol. and Psychiat.*, 33:570-591, (March) 1935.
5. von Economo, C.: Sleep as a problem of localization. *Jour. Nerv. and Ment. Dis.*, 71:249-259, (March) 1930.
6. Eaves, E. C., and Croll, M. M.: Pituitary and hypothalamic region in chronic epidemic encephalitis. *Brain*, 53:36-75, (April) 1930.
7. Frazier, C. H., Alpers, B. J., and Levy, F. H.: Anatomical localization of the hypothalamic center for regulation of temperature. *Brain*, 59:122-129, (March) 1936.
8. Fulton, J. F.: *Physiology of the Nervous System*. London: Oxford Univ. Press, 1938, pp. 249-261.
9. Fulton, J. F., and Bailey, P.: Tumors in the region of the third ventricle: their diagnosis and relation to pathologic sleep. *Jour. Nerv. and Ment. Dis.*, 69:145-261, 1929.
10. Fulton, J. F., Jacobsen, C. F., and Kennard, M. A.: Note concerning frontal lobes to posture and forced grasping in monkeys. *Brain*, 55:524-536, (Dec.) 1932.
11. Levin, Max: Periodic somnolence and morbid hunger: new syndrome. *Brain*, 59:494-504, (Dec.) 1936.
12. Masten, M. G.: Personal communication.
13. Ranson, S. W.: Some functions of hypothalamus. *Bull. N. Y. Acad. Med.*, 13:241-271, (May) 1937.
14. Ranson, S. W., and Fisher, C., Ingram, W. R.: Hypothalamic regulation of temperature in monkey. *Arch. Neurol. and Psychiat.*, 38:445-446, (Sept.) 1937.
15. Ranson, S. W., Kabat, H., and Magoun, N. W.: Autonomic responses to electrical stimulation of the phythalamus, preoptic region, and septum. *Arch. Neurol. and Psychiat.*, 33:467-477, (March) 1935.

CARCINOMA OF THE CERVIX UTERI: FACTORS INFLUENCING PROGNOSIS*

HARRY H. BOWING, M.D.

Rochester, Minnesota

IT IS generally agreed that the following factors are important in determining the prognosis in the average case of carcinoma of the uterine cervix: (1) extent of the local lesion; (2) age of the patient; (3) general health and vigor, and (4) resistance to the malignant growth. A statistical study of 1,491 cases of carcinoma of the cervix encountered in the Section on Therapeutic Radiology of The Mayo Clinic from 1915 to 1929, inclusive, furnishes some additional data. On the basis of these data, the following topics as well as the four prognostic factors already mentioned will be considered: (1) influence of sterility and fertility; (2) influence of biopsy; (3) histologic types; (4) grade of malignant change; (5) technic of treatment employed; (6) experience of the radium therapist; (7) hospital mortality, and (8) treatment of recurrent lesions.

Statistical data and clinical impressions have

definite limitations in the consideration of these topics; however, these data and clinical impressions may indicate in a measure a valuable trend or may constitute a definite lead and may indirectly assist in an attempt to formulate a worthwhile opinion. Some of the topics do not lend themselves at all to a statistical analysis. It is impossible to arrange these topics according to their importance as there are many factors which influence the choice or selection.

Extent of the Local Lesion

The extent or stage of the primary lesion and the extent or stage of the secondary lesions always have been and are today of major importance to the physician in deciding whether or not the patient has a chance for cure or palliation. A suitable classification is essential for proper interpretation of the immediate and late results. The extent of the primary and secondary lesions is the basis of the following classification: Stage 1 denotes that the primary lesion is limited to the cervix of the uterus. Stage 2 indicates that the

*From the Section on Therapeutic Radiology, The Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 31 and June 1 and 2, 1939.

CARCINOMA OF THE CERVIX UTERI—BOWING

TABLE I. CLASSIFICATION OF CARCINOMA OF THE UTERINE CERVIX ACCORDING TO STAGE OF INVOLVEMENT IN 1,079 CASES*

Stage of involvement	Cases	Per cent
1	13	1.2
2	85	7.9
3	825	76.4
4	156	14.5
Total	1,079	100

*In 412 of the series of 1,491 cases the lesions had been modified by previous treatment.

TABLE II. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE ACCORDING TO STAGE OF INVOLVEMENT

Stage of involvement	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
1	13	13	9	69.2
2	85	78	47	60.2
3	825	753	224	29.7
4	156	138	9	6.5
Total	1,079*	982 (91.8%)	289	29.4

*Fourteen, or 1.3 per cent, of the 1,079 patients died in the hospital during the course of treatment.

primary lesion involves the cervix and has caused moderate infiltration of the vaginal wall or the parametrial tissues; in this stage the uterus is movable. Stage 3 indicates that the primary lesion has extended well beyond the cervix infiltrating the parametrium and has caused definite fixation of the uterus. Stage 4 indicates that the primary and secondary lesions have caused extensive local infiltration and involvement of pelvic structures and that there is wide fixation of the uterus with or without metastasis to distant regions.

Table I shows the stage of involvement in 1,079 cases in which the lesion had not been modified by previous treatment. The data in this table were obtained from the clinical, surgical and special records. In more than 90 per cent of the 1,079 cases, the disease was beyond any type of curative surgical intervention.

Table II shows the stage of the disease and

TABLE III. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE, ACCORDING TO AGE OF THE PATIENTS

Age, years	Patients treated	Patients traced	Lived five or more years after treatment	
			Number	Percentage of traced patients
20-39	312	285	68	23.8
40-59	948	863	235	27.2
60-79	230	203	59	29.1
Total	1,490*	1,351* (90.7%)	362	26.7

*One patient, who was between eighty and ninety years of age and who lived five years after the completion of treatment, is not included in this table.

the number of patients who lived five or more years after the completion of irradiation. Although the number of cases in which the disease was classified as stage 1 or 2 is comparatively small, the data in this table seem to indicate that the stage of involvement does have a definite relationship to the prognosis.

Age of the Patient

In general, young adults or elderly persons who have carcinoma are adjudged to respond poorly to treatment and the ultimate prognosis is not good. The presence of degenerative disease frequently influences adversely the prognosis for elderly persons.

Table III shows the relation of the age of the patient to the prognosis in 1,490 of the 1,491 cases. This table does not include one patient who was between eighty and ninety years of age and who lived five years after the completion of treatment. The total number of cases were divided into three groups according to the age of the patients. The data in this table indicate that the age of the patient does not have any appreciable influence on the prognosis. Evidently, patients who receive individual radium therapy for carcinoma of the uterine cervix, regardless of age, have about an equal chance for survival for five years or more. The older age group have a slight advantage in this regard over the younger age groups.

General Health of the Patient

From the standpoint of the radiotherapist, the general health and vigor of the patient are very important. Such complications as second-

ary infection and secondary anemia tend to decrease the resistance of the patient and retard the response of the patient to treatment. Patients who are vigorous and in good general health can tolerate adequate doses of radium and roentgen rays very well. In cases of advanced or extensive carcinoma in which complications have affected the general health of the patient, both local and general supportive measures are necessary and only limited radiotherapy can be employed.

The statistical data concerning the general health of the 1,491 patients are incomplete. From clinical experience we may conclude that the general health of the patients who have stage 1 and 2 lesions is good. Patients who have stage 3 lesions may show a moderate secondary anemia or patients with recent severe hemorrhage may need special consideration before treatment is started; as a rule patients who have stage 4 lesions experience comparatively a severe break in general health.

The most important consideration is the healing or absorption of the malignant lesion or lesions; in other words, the bodily reactions should be at their best in order that the malignant lesion may lose its malignant features and the affected part if possible may be restored. Usually, cervical carcinoma is secondarily infected. These two pathologic conditions, carcinoma and infection, make a simultaneous demand on the patient's health. With proper treatment and in a relatively brief period, the malignant lesion and the inflammation will respond. The local cellulitis with minimal ulceration does not require any special treatment. Pelvic cellulitis with fever has responded well to chemotherapy, sulfanilamide for example. Pelvic abscess may require surgical treatment. Infection by way of the blood stream is usually a serious complication. Co-existing pyometritis will subside after simple procedures, such as uterine drainage.

Resistance to the Malignant Growth

As yet we have no clinical or laboratory test that would definitely indicate resistance or non-resistance to the malignant growth. Clinically, there are two varieties of cervical carcinoma, the medullary type and the infiltrating or ulcerating type. Theoretically, the medullary type begins as a superficial growth in the epithelium of the portio vaginalis and proceeds to enlarge into the

vaginal cavity. Its infiltrating characteristic is a relatively minor feature. The ulcerating type probably begins within or beneath the epithelium of the lower uterine segment as a nodular growth. It infiltrates the uterus and parametrial tissues readily, and as growth proceeds it tends toward ulceration. Clinically, the medullary variety seems to grow more rapidly than the ulcerative variety. There is a possibility that the patient's resistance or lack of resistance may be reflected in the gross characteristics of these two comparatively distinct types of carcinoma. Little is known about the time element or speed of development of any malignant lesion of the uterine cervix. As a rule, the history, regardless of how carefully it is taken, cannot be relied on for determining the actual time of onset of the disease. The correlation of accumulated data seems tedious and the many variations make the problem difficult of solution. However, careful clinical studies will add to our knowledge and eventually we may be able to understand better these characteristics that we are considering. Results of radiation therapy have definitely proved that with proper treatment the patient has the power or ability to heal or restore the affected part to normal. Evidently this phase of our problem was not fully appreciated by early workers in the field of malignant disease. Naturally, therefore, everything possible should be done to support the patient in conjunction with adequate irradiation and thus assure satisfactory recovery.

The Influence of Sterility and Fertility

The etiology of carcinoma of the uterine cervix is unknown, in that there are no benign lesions of the cervix that have been proved to be always premalignant. Among the predisposing factors of cervical carcinoma, lacerations, erosions, eversion and the like are always considered of importance. Because pregnancy is the most common single cause for cervical trauma, a record of the sterility and fertility of the total group was compiled.

The civil state of the total 1,491 cases is as follows: There were 1,473 (98.8 per cent) married patients and eighteen (1.2 per cent) single patients. One or more pregnancies occurred in each of 1,320 patients, an incidence of 88.5 per cent. According to the records of 149 patients (10 per cent), pregnancy did not occur. In

twenty-two records (1.5 per cent), the incidence of gravidity was not stated. There were 4,792 pregnancies that proceeded to full term and 973 miscarriages were recorded for the entire group. Excluding the aforementioned twenty-two histories, the average number of pregnancies for the group was 3.3 pregnancies per patient.

TABLE IV. RESULTS OF TREATMENT OF CARCINOMA OF THE UTERINE CERVIX BY IRRADIATION ALONE. PERCENTAGE SURVIVAL RATES ACCORDING TO THE STERILITY OR FERTILITY RECORDED

	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
One pregnancy	262	242	67	27.7
Two or more pregnancies*	991	896	250	27.9
No pregnancy	149	136	28	20.6
Miscarriage (only)	67	60	17	28.3
Not stated	22	18	1	5.6
Total	1,491	1,352	363	26.8

*From 2 to 15 pregnancies.

The percentage survival rates are listed in Table IV according to the data on sterility or fertility in the clinical record. Each of 991 patients experienced two or more pregnancies that proceeded to full term and 250 patients (27.7 per cent) lived five or more years after treatment. There were 262 patients who experienced one full-term pregnancy and sixty-seven of these (27.7 per cent) lived five years or more after treatment. There were 149 patients who did not experience pregnancy and of these twenty-eight (20.6 per cent) lived five or more years after treatment. Sixty-seven patients experienced miscarriage, only, and of these, seventeen patients (28.3 per cent) lived five or more years after treatment.

Evidently carcinoma of the uterine cervix is a disease of married women; however, it is infrequent among Jewish women.^{1, 4} Furthermore, the number of pregnancies did not significantly influence the prognosis or the survival rate for five years and more among those groups studied, and the lowest percentage of five-year survivals or more occurred in the group in which no pregnancies occurred.

The Influence of Biopsy

For our purpose, there are two kinds of biopsies. One may be designated a surgical biopsy and may be considered as a minor surgical procedure, whereas the other may be designated a therapeutic biopsy. The surgical biopsy usually requires administration of a general anesthetic agent which permits a more liberal bimanual palpation of the pelvic structures, especially if the patient is nervous or apprehensive. Thus, it furnishes valuable, additional information. The speculum and tenaculum are placed to afford exposure and if the lesion is only partly movable, the maintenance of adequate exposure may be very tedious. The pathologic tissue is removed by incision, which may extend into the normal tissue. As a rule, the specimen consists of a piece of tissue representative of the part and therefore most reliable for histologic study. The actual cautery may be applied to control bleeding or one or more sutures may be necessary. A gauze pack is placed in the vagina.

The therapeutic biopsy is performed at the time of the first application of radium. A general anesthetic is not necessary. The patient is placed in the knee-chest position. A speculum and some type of direct light allow for ample exposure. The entire vaginal portion of the pathologic lesion can be readily inspected and a representative site can be selected from which to remove the specimen. Trauma is reduced to a minimum in that a tenaculum is not used. A bit of tissue, the size of a grain of wheat, is removed with a tracheal biopsy instrument in the average case. The area selected is free of necrosis and may be considered as an everted surface of the malignant infiltrating lesion. The normal tissues are not disturbed. There is very little bleeding, if any. The number of positive findings on the small piece of removed tissue is very high; only occasionally may the pathologist ask for another specimen.

An ideal procedure for biopsy would be one without trauma or risk to the patient. The first procedure mentioned is definitely traumatic and there is some attendant risk, whereas the latter procedure in a measure does approach the ideal and carries very little risk, if any. Biopsy is an essential part or feature of the diagnostic procedures and should be a routine requirement in all cases selected for treatment. In selected

CARCINOMA OF THE CERVIX UTERI—BOWING

cases, the surgical biopsy together with dilatation and curettage, may be necessary to establish the diagnosis. Especially is this true, should the history and gross appearance of the cervical lesion be atypical; therefore everything possible should be done to establish the diagnosis of carcinoma of the uterine cervix. A failure to diagnose stage 1 or 2 lesions is a serious matter for, in the interval, the patient may pass into the third or fourth stage of the disease in which the ultimate prognosis is only fair or palliation is all that can be expected.

I am certain that the risk of a surgical biopsy and especially the very slight risk of a therapeutic biopsy is outweighed by the positive information it affords.

The Histologic Types

More than 90 per cent of malignant lesions of the uterine cervix are squamous-cell epithelioma. About 5 to 8 per cent are adenocarcinoma and the remainder are a combination of squamous-cell epithelioma and adenocarcinoma.²

The gross appearance of the lesion does not allow determination of the histologic type. Infiltrating lesions probably predominate. The medullary lesion of the portio vaginalis is usually squamous-cell epithelioma, grade 3 or 4, and is prone to necrosis, hemorrhage and secondary infection, whereas infiltrating squamous-cell epithelioma or adenocarcinoma occurring in the portio supravaginalis tends toward early infiltration and may block the cervical canal, obstructing the flow of uterine secretion and ultimately bringing about various degrees of pyometritis and pain that simulate menstrual pelvic distress. The latter complication occurs as a feature of the character and the site of the malignant lesion rather than as a result of radium therapy. Adenocarcinomas are in the minority and the small number for which treatment has been given were of the lower grades of malignancy and as a rule they furnished a slightly better prognosis than squamous-cell epitheliomas with irradiation therapy.

Grade of Malignant Change

The grade of malignant change is a very valuable contribution to our knowledge of malignant disease. A broad view of malignant disease taught us that the individual, the site of involve-

TABLE V. RESULTS OF RADIATION THERAPY FOR CARCINOMA OF THE UTERINE CERVIX, BASED ON THE GRADE OF MALIGNANT CHANGE

Group	Patients treated	Patients traced	Lived five years or more after treatment	
			Number	Per cent*
Grade 1	5	5	2	40.0
Grade 2	135	122	40	32.8
Grade 3	407	362	125	34.5
Grade 4	336	307	105	34.2
Total	883	796†	272	34.2

*Percentage of traced cases.

†90.7 per cent traced, total 1,491 cases.

ment and the gross characteristics of the disease did furnish valuable data; however, their interpretation was not very clear. From the standpoint of the surgeon and the radium therapist we can assume that grading of the malignant change does furnish an opinion of the pathologist to guide our therapeutic endeavors. The surgeon fully appreciates the fact that the majority of patients who have malignant disease of high grade do poorly regardless of the method of surgical intervention, whereas carcinomas of low grade have a much better surgical prognosis. For the radium therapist, grading of neoplasms has furnished the basis for a therapeutic rationale.

Briefly stated, there are two elements in a malignant tumor. One is the characteristic tissue cell that makes up the parenchyma of the tumor and the other is the stroma or supporting matrix with its varying degrees in amount and kind of cellular infiltration. It is reasonable to assume that there are intrinsic and extrinsic factors that influence these elements. These reactions are very complex and for the present may be considered a life process that in a measure can be influenced by the factors employed in therapeutic radiology. Surely, this is a phase of radiosensitivity the nature of which is not too well or only very incompletely understood. The more we master or control these influences or reactions, the greater or better will be the result of our therapeutic endeavors. As has been stated, carcinomas of high grade respond poorly to surgical intervention and respond more satisfactorily to radiotherapeutic methods, as is clearly shown in the statistic results obtained in cases of carcinoma of the uterine cervix. Our surgical experience further shows that low grade car-

CARCINOMA OF THE CERVIX UTERI—BOWING

TABLE VI. AGE ACCORDING TO GRADE OF MALIGNANT CHANGE*

Age, years	Grade 1		Grade 2		Grade 3		Grade 4	
	Number of patients	Per cent	Number of patients	Per cent	Number of patients	Per cent	Number of patients	Per cent
20-29	0		0		9	56.3	7	43.7
30-39	0		24	14.2	71	42.0	74	43.8
40-49	3	1.0	40	13.7	120	41.1	129	44.2
50-59	1	0.4	45	16.9	82	30.7	139	52.0
60-69	1	0.8	25	20.0	46	36.8	53	42.4
70-79	0		1	7.7	7	53.8	5	38.5
80-89	0		0		1	100.0	0	
Total	5	0.6	135	15.3	336	38.0	407	46.1

*883 cases.

cinomas respond well to surgical intervention. With these data as a working basis, some investigators have assumed that carcinomas of low grade are radioresistant. Evidently the latter conclusion is only partly correct in that such carcinomas will respond to proper treatment and that adequate treatment seems to give at least the same degree of good results for carcinomas of both low and high grades. It is incorrect to assume that, because carcinomas of high grade are radiosensitive, carcinomas of low grade should not be radiosensitive.

The data in Table V are submitted to corroborate the aforementioned statement regarding influence of grade of malignant change on the five-year survival rate. There were 883 cases in which the lesions were graded and 796 of these cases were traced. Of these 796 patients, 272 lived for five years or more, a survival rate of 34.2 per cent. The total cases are subdivided according to the grade of pathologic change. Treatment for lesions graded 3 and 4 gave equal percentages of five-year survival rates which are similar to the average percentage for the group. There are very few lesions grade 1, and when encountered they prove to be adenocarcinoma. The grade 2 lesions are also in the minority. The five-year survival rate in cases of grade 1 lesions was 40 per cent; grade 2 lesions, 32.8 per cent. In general, tumors of low grade in our experience have given a slightly increased survival rate when compared with lesions of high grade, provided that the patients are not treated according to rule but according to their mode of response to the treatment.

TABLE VII. THE AGE GROUPS OF ALL CASES COMPARED TO THE AGE GROUPS OF THE GRADED CASES.

Age, years	All cases		Graded cases	
	Total	Per cent	Total	Per cent
20-29	28	1.9	16	1.8
30-39	284	19.0	169	19.1
40-49	496	33.3	292	33.1
50-59	452	30.3	267	30.2
60-69	208	13.9	125	14.2
70-79	22	1.5	13	1.5
80-89	1	0.1	1	0.1
Total	1,491*		883†	

*58.9 per cent of all cases.

†91.9 per cent of patients traced.

Influence of Age on Grade of Malignant Change

The influence of age on grade is also misunderstood in that some observers are of the opinion that young patients have carcinomas of high grade and that old patients have carcinomas of low grade. Study of carcinomas of the uterine cervix does furnish some data, especially concerning lesions of high grade, whereas the number of low grade lesions is relatively small for an analysis. In Table VI the ten-year age groups were arranged according to the grades of malignant change. When the percentages of distribution of age groups and grades are compared, there seem to be no outstanding differences. The distribution of ages compared equally throughout the table. Only 883 lesions of the total of 1,491 patients were graded, so an attempt was

made to determine whether the age distribution indicated in Table VI was representative of all the cases. In Table VII, the respective age groups are shown for both the graded cases and the total number of patients in the study. The similarity between the percentages of all cases and those of the graded cases in regard to their respective age groups should be noted; for example, the age group forty to forty-nine years, in which there were 496 patients (33.3 per cent) for all cases, whereas the number of cases in which lesions were graded in the same age group was 292 (33.1 per cent).

The data in this study show rather clearly that the age distribution and distribution of malignant change favor no special age group. The young and the old patient may have a carcinoma of low or high grade.

Technic of Treatment Employed

The radium technic employed at the clinic in the treatment of carcinoma of the uterine cervix may be defined as an intensive, multiple or broken-dose method.³ The radium or radon content of the universal tubes is in the range of 50 mg. or millicuries, respectively. The filters are kept constant. The only variables in the technic are the treatment time and the time between applications. The patient, however, represents an unlimited amount of variables. To vary the treatment time and the time between applications makes it possible for the radium therapist to treat his patient individually. The technic furnishes the widest distribution of the therapeutic energy throughout the field of the primary lesion. Another valuable attribute is that the primary field receives apparently adequate therapy, whereas the adjacent normal tissues receive the maximal radiation or the amount of radiation which they seem to tolerate. The primary lesion is treated with radium therapy as the initial procedure and roentgen-ray therapy is given as a supplemental treatment at the completion of the applications of radium. All patients, while treated and observed, are in the knee-chest position. The hospital stay is reduced to a minimum in that the plan necessitates that the patient remain at rest in bed only during the time of application. The number of days spent in the hospital varies from eight to ten, whereas the total time required for treatment varies

from four to five weeks on an average for patients whose disease is in stage 3.³

Briefly stated, an ideal technic for radium therapy is one that can be applied with very little or no risk to the patient and at the same time will adequately influence the primary lesion and, if possible, the adjacent metastatic deposits. The technic so briefly outlined previously is not at all perfect; however, it does approach the ideal technic as defined.

The Experience of the Radium Therapist

The experience of the radium therapist is a valuable contribution to the science and art of radium therapy. The skill and practical wisdom gained by personal knowledge based on study and repeated observation do become reflected in the immediate and late results obtained. His task is not a simple one; instead, it is exceedingly complex. For example, the surgeon speaks of surgical judgment and we respond immediately in that we appreciate in a measure the meaning that he wishes to convey. With the same feeling we may mention radiotherapeutic judgment. The patient must not only tolerate and overcome the effects of the therapeutic procedure employed but also the therapist must interpret, in a measure at least, the probable response which the patient will make to a given procedure in order to obtain an initial good result which will eventually affect the five-year survival rate.

The work of the radium therapist in the early years of development of the field was more than double that of the radium therapist of today. The early worker had to acquaint himself with the radium applicators and the pathologic lesion which the patient presented. After almost forty years of work in this relatively new field of therapy for carcinoma of the uterine cervix, several technics have been comparatively well standardized. However, as yet, no worker in our field has been able to standardize the patient. So every patient who presents herself for consideration is a challenge to the radium therapist. With the diagnosis, the gross character of the tumor, the patient's general health, and the proper selection, timing and spacing of applicators, the initial result may be very encouraging and it may exceed our expectations and endure for many years. No patient should receive more irradiation than that which is necessary to heal

CARCINOMA OF THE CERVIX UTERI—BOWING

the lesion under treatment. The adjacent tissues should receive no more exposure to the therapeutic rays than will be tolerated with safety.

In Table VIII the data of the fifteen-year period are divided into three periods of five years each. The irradiation technic employed in the first period showed 8.3 per cent as the incidence of cure for five years or more. The second and third periods gave equal incidences of cure, 34.9 and 34.7 per cent, respectively, for five years or more. The difference in incidence of cure of the first period and that of the second period is significant, and the chief factors that brought about such a change were a change in the therapeutic technic, a better appreciation of the radium applicators, a better understanding of the patient's response to treatment and a better distribution of the therapeutic rays in the field of treatment. Prior to 1923, all carcinomas of the uterine cervix received moderate voltage (135 kv.) roentgen therapy and beyond that date so-called high voltage (200 kv.) roentgen therapy was employed. It seems evident that, as our knowledge and experience increased, the incidence of cure for five years or more also increased, especially so, following the first five-year period.

Hospital Mortality

The hospital mortality for the entire group of 1,491 patients was 1 per cent.² There were fourteen deaths (Table II) in the stage 3 and 4 groups (1.4 per cent). In the stage 1 and 2 groups there were no deaths, whereas in the modified group (all stages) there was one death. The period of treatment and observation necessary for completion of the irradiation technic requires about five weeks. The actual hospital stay is about ten days. Every endeavor is made to keep the patients ambulatory between treatments. When one recalls that the major groups in this study are patients who had extensive lesions, with varying degrees of actual and potential serious complications, it is stimulating and highly encouraging to know that they can be effectively treated with so little risk.

Treatment for Recurrences

Recurrence of carcinoma of the uterine cervix, in a strict sense, is rare today, in that surgical therapy is not employed as it was years ago in the management of such cases. Some of the

TABLE VIII. CARCINOMA OF THE UTERINE CERVIX TREATED WITH IRRADIATION ALONE. RESULTS TABULATED ACCORDING TO PERIODS IN WHICH TREATMENT WAS GIVEN

Five-year groups inclusive	Patients treated	Patients traced	Lived five or more years after treatment	
			Number	Per cent*
1915-1919	288	264	22	8.3
1920-1924	556	410	143	34.9
1925-1929	647	571	198	34.7
1915-1929	1,491	1,245 (83.5%)	363	29.1

*Percentage of traced cases.

patients included in this study did have major surgical procedures performed, as well as an initial course of irradiation therapy (in the main, elsewhere, however), and the majority evidently were treated with apparently insufficient surgical intervention and irradiation. The treatment did bring about what might be termed superficial healing and thus reduced the tendency toward hemorrhage, local ulceration and toxic absorption. This favorable influence was reflected in the comparatively favorable status of general health. In some, there was extensive radionecrosis, and in adjacent tissue active carcinoma was present. The treatment which they had received did change the actual gross appearance of the lesions and naturally did restrict the subsequent limited radium therapy employed here. This is the main reason why the cases are grouped separately and are termed "modified." These cases are deserving of a more adequate and complete analysis. As a rule, treatment for such a group is very tedious; for example, the radionecrotic tissue must be protected or shielded from further exposure while the adjacent active tissue is actively treated. The anatomic relationships are altered, making it difficult, and in some cases impossible, to locate the cervical canal and uterine cavity. In a consideration of these patients, one is tempted to evaluate the importance of sentiment in the treatment and consulting room. The relatives are very solicitous and are anxious that something further be done, in that they do not want hope taken from the patient. Every endeavor should be made to acquaint the relatives with the risk and ultimate guarded prognosis; if they are willing to share the responsibility, a limited treatment usually can be applied. At least, bleeding, odor and pain

CARCINOMA OF THE CERVIX UTERI—BOWING

TABLE IX. RESULTS OF TREATMENT (WITH IRRADIATION ALONE) OF CARCINOMA OF THE UTERINE CERVIX PREVIOUSLY MODIFIED BY VARIOUS TREATMENTS ELSEWHERE. PERCENTAGE SURVIVAL RATES AND STAGE OF INVOLVEMENT AT THE TIME OF THE SUBSEQUENT TREATMENT

Stage of involvement (modified)	Patients treated	Patients traced	Lived five or more years after treatment	
			Patients	Per cent of those traced
1	4	4	4	100.0
2	28	25	14	56.0
3	297	267	53	19.8
4	83	74	3	4.0
Total	412*	370	74	20.0

*One patient died during the course of subsequent treatment, a hospital mortality of 0.2 per cent.

can be favorably influenced. It is surprising to know that members of this group have a chance to survive five years or more, especially the stage 3 and 4 groups.

The small number of cases (Table IX) in the stage 1 group no doubt accounts for the unusual incidence of five-year cures and more than five-year cures obtained. It may emphasize also the importance of a careful follow-up system, in that, when adequate therapy is applied to small regions in which a recurrence has occurred, the period of palliation may be substantially extended. As a rule, further palliation does occur in all cases. It is possible, for example, to arrest the infiltration into the anterior vaginal wall; thus, a vesicovaginal fistula may be prevented or at least its formation may be delayed sufficiently to be of minimal distress to the patient. This is equally true of the prevention of rectovaginal fistula and probably unilateral or bilateral hydronephrosis. In a selected number of cases in which fistulas were present, and after suitable treatment and an interval to allow the tissues to approach a normal status, surgical intervention was then done for the correction of the anatomic defects. Our early results have been very encouraging. Three in the stage 4 group survived. One assumption is possible, in that all of the cells which infiltrated the region were not actively malignant.

Evidently these patients with so-called recurring carcinoma do deserve our best efforts in that with limited treatment and medical and surgical care they have a chance of survival for five years or more, and in nearly all cases the period of palliation can be definitely lengthened.

Summary

No attempt has been made to exhaust the topic under consideration or the data this group of patients furnished, nor have definite conclusions been formulated. However, there are some interesting factors for analysis, although the statements made may be incorrect. The study of this group has advanced our knowledge of this disease and the patients treated today should receive superior therapy and a better result should be theirs when compared with those of previously treated patients. Naturally, the extent of the local and distant malignant lesions, the age of the patient and his general health or vigor are the most important factors which will definitely limit the survival rates over a period of five years or more. From the standpoint of the radium therapist, the method or technic which he employs and the completeness with which the initial radium therapy is applied, based on judgment and skill, have a definite bearing on the immediate result and ultimate prognosis. Careful consideration by the experienced therapeutic roentgenologist should be given to those patients who are to receive supplemental primary and subsequent roentgen therapy. Patients who have recurrent lesions should be treated with care and consideration, for they can be definitely benefited and some will survive for five years and longer. All concerned must cooperate to obtain the utmost in "cure" and palliation for patients who have carcinoma of the uterine cervix.

References

1. Bowing, H. H., and Fricke, R. E.: Carcinoma of the uterine cervix; a survey of treatment and results in 1,491 cases. *Am. Jour. Roentgenol.*, 40:47-51, (July) 1938.
2. Bowing, H. H., and Fricke, R. E.: Radiosensitivity of malignant neoplasms of the uterine cervix. *Jour. A.M.A.*, 111: 1902-1907, (Nov. 19) 1938.
3. Gardner, G. H.: Cancer of the cervix. In *Nelson's New Loose-Leaf Surgery*. New York, Thomas Nelson and Sons, 1927, vol. 7, pp. 170-208E.
4. Horwitz, Alec.: Incidence of carcinoma of the uterus among Jewish women. *Surg., Gynec. and Obst.*, 44:355-358, (Mar.) 1927.

INHIBITION ILEUS*

E. A. HEIBERG, M.D., F.A.C.S.

Fergus Falls, Minnesota

THE main purpose of this paper is to review briefly the present day methods of treatment of paralytic or inhibition ileus. It is a very common surgical complication; yet it is often difficult to recognize early and to treat successfully.

This type of ileus is not due to any form of mechanical obstruction, but is due to either a change in the intestinal wall, or to interference with its nerve supply, resulting in an inhibition of normal intestinal movements and a functional inactivity of the bowel.

Etiology

Paralytic ileus is noted most often in the presence of peritonitis. Varying in duration and degree, it is seen following every intra-abdominal operation, but, fortunately, the distention, nausea and vomiting usually subside in eight to twenty-four hours, when the dilated gut begins to contract with the production of "gas pains." During the performance of a laparotomy, trauma, exposure of the bowel to air, and packs that are too hot or too cool are frequently factors in producing adynamic ileus. Several writers have noted that worried, apprehensive patients are somewhat prone to develop postoperative ileus. Penetrating abdominal wounds, the extravasation of blood, and mesenteric thrombosis are also etiologic factors. Paralytic ileus may be of nervous origin, as the result of injuries and diseases of the spinal cord, or fracture of the lower ribs or lead poisoning. It may be of toxic origin as in pneumonia, uremia, undulant fever, meningitis and empyema. And it may be reflex as noted in renal or gallbladder colic, torsion of an ovarian cyst, crushing of a testis or strangulation of the spermatic cord.

Pathology

A progressive dilatation of the bowel with a corresponding thinning of all the layers of the intestines is the only pathological change noted in early paralytic ileus. As a result of this distention, intestinal secretion is increased, while the venous stasis diminishes absorption from the

bowel, so that large amounts of stagnant toxic fluid collect in the gut. Swallowed air, fermentation and gas-producing organisms also play a part in increasing this distention. At first the bowel is normal in appearance, but the persistent venous stasis, produced by the extreme dilatation, causes it to become progressively lavender, purple, black and gangrenous. The intra-abdominal exudate may be serous, fibrinous or fibrinoplastic.

Signs and Symptoms

In paralytic ileus, the predominating sign is abdominal distention, which usually involves the entire bowel. The pain, if present, is not intermittent or colicky in character, but is described as being a continuous dull generalized abdominal ache. As the tympanites increases, the pylorus relaxes, permitting intestinal contents to regurgitate into the stomach, producing nausea and later vomiting. Respirations become rapid and shallow, due to the marked increase of intra-abdominal pressure. The pulse is rapid and thin. The patient appears to be alert and apprehensive at first, but gradually becomes drowsy, cyanotic, and comatose. Delirium often supervenes before death. Peristalsis is relatively or completely inhibited, resulting in a "silent abdomen." A scout film will show a gaseous distention of both the small and large bowel, fluid layers between the coils, fluid mirrors in which air is layered over fluid, and frequently a so-called "ladder pattern" is noted.

Treatment

Prophylactic treatment is extremely important in adynamic ileus. Preoperative care includes mental preparation of patient, because a "nervous," worried patient is more susceptible to stimulation of the sympathetics, with a resultant inhibition of peristalsis. Therefore the fears and apprehension of all such patients should be allayed as much as possible.

Cathartics should not be given before surgery. Alvarez has shown that, following purgation, there follows a period of inhibition of peristalsis.

In the operating room prophylaxis is very important. The intestines must be handled very

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minn., September 8 and 9, 1939.

gently, they should be exposed to the air as little as possible, and blunt dissection should be avoided. Proper temperature of all moist laparotomy packs must be maintained; and careful hemostasis must obtain, because free blood in the abdominal cavity acts as a peritoneal irritant. Soresi and Brown, among others, advise dilating the anal sphincter before the patient leaves the operating room, to permit gas to escape freely from the rectum.

Postoperatively, all liquids by mouth should be withheld until nausea and vomiting have subsided. A common practice is the routine application of heat to the abdomen, by stupes or the use of a cradle equipped with electric bulbs, or short wave diathermy, until signs of ileus have subsided.

After establishing a diagnosis, morphine is a very useful drug, and may be used freely in paralytic ileus. We formerly believed that morphine "splinted" the bowel, but recent studies have definitely demonstrated that it increases its tone. Ochsner states, "Morphine should be administered liberally after operation (in the case of an adult, unless some contraindication exists, the patient should receive $\frac{1}{4}$ grain of morphine sulphate every four hours whether they complain of pain or not), because, as has been shown repeatedly both in the laboratory and the clinic, morphine increases the intestinal tone and does not inhibit the gut as is commonly thought."

If these preventive measures are unsuccessful, and paralytic ileus develops, prompt and energetic treatment is necessary.

1. To combat the dehydration, starvation and hypochloremia, saline and glucose solutions must be given intravenously. Hypertonic salt solutions are very useful not only to replace the chlorides that are lost, but also to stimulate peristalsis. Wangenstein states that, " $\frac{1}{10}$ to $\frac{1}{3}$ gram per kilo body weight may be safely injected. 75 to 100 cc. of a 15 per cent solution of sodium chloride is the usual dose for a person weighing 150 pounds."

Glucose solutions may also be given, by hypodermoclysis or intravenously. Ochsner and Gage report that they have demonstrated that glucose intravenously inhibits peristalsis, but that this effect is lost when sufficient insulin is given to "cover" the full amount of dextrose administered.

Sufficient fluids should be given to maintain a daily urinary output of 700 to 1,000 c.c.

2. Different drugs, used to stimulate intestinal activity, have been used with variable results. Chief among these are physostigmin (eserin), prostigmin, pitressin, choline and acetylcholine.

Physostigmin produces powerful contractions of the smooth muscle of the intestines, probably by stimulating the vagus. It must be used with considerable caution, however, because larger doses than 1/30 gr. hypodermically may produce central vasomotor paralysis, cardiac depression, dyspnea, myosis, drop in blood pressure and tetanic contraction of the gut.

Because of these undesirable side-effects, physostigmin has been supplanted to a great extent during the past few years by prostigmin, which is a white crystalline powder that forms a very stable solution. It is obtainable in two concentrations, a 1:4000 solution for prophylaxis, and a 1:2000 solution for treatment. The prophylactic dose is 1 c.c. of 1:4000 solution every six hours starting the day before surgery and continuing until the second or third day postoperative. The treatment dose is 1 c.c. of 1:2000 solution, repeated as necessary. Beck, in a report of 220 cases, reports that prostigmin has a marked effect upon the intestine without affecting the heart. Gaenssle reports that this drug has no unpleasant effect upon the heart. Saegesser and others also comment on the absence of by-effects.

Pitressin, which contains the pressor substance of the posterior lobe of the pituitary body, often gives satisfactory results in relieving intestinal distension. It is administered in 1 c.c. doses, repeated as indicated.

Choline and its derivative, acetylcholine, occur in animal and vegetable tissues and in some drugs, especially ergot. Their effect upon the intestine is similar to eserine.

Canney reports a cure in 75 per cent of his cases of postoperative ileus by the use of choline chloride. Abel advises intramuscular injections of acetylcholine in 0.1 gm. doses every two or three hours until gas is expelled.

3. Enterostomy. Until Wangenstein demonstrated the splendid results that can be obtained by the use of the indwelling nasal suction

catheter, enterostomy was generally considered the mainstay in the treatment of paralytic ileus. While this surgical method of draining the intestine has often been a life-saving measure, it is, as Wangenstein points out, "only of very limited value because only a short segment (of the bowel) on either side of the enterostomy catheter is evacuated by the tube." For this reason several surgeons have, in the past, advised performing multiple enterostomies. The present day concept of the comparative value of these two methods of intestinal drainage, is, I believe, aptly put by Jackson when he states "that in a general way an enterostomy is indicated in all cases of adynamic ileus requiring intestinal drainage, where for any reason nasal catheter suction cannot be employed, or results cannot be obtained by its use." In other words, the nasal suction apparatus has supplanted the enterostomy as the method of choice in draining the bowel in cases of paralytic ileus.

4. Spinal anesthesia. The splanchnic or sympathetic nerves, which act as inhibitors of the intestines, are blocked by spinal anesthesia. By shunting out the influence of the sympathetics, the motor nerves are unopposed and active peristalsis results. Since in paralytic ileus there is an overactivity of the sympathetic nervous system, it is highly desirable to block out its influence on the bowel. For this reason, spinal anesthesia is widely used in this type of ileus. Splanchnic analgesia is employed by some men, but, according to Brown, the technic is more difficult and likewise more dangerous. He advises using three-fifths the spinal anesthesia dose because that amount of anesthetic does not produce a great fall in blood pressure and is fairly safe when given below the first lumbar vertebra. It should be added that in combating this drop in blood pressure adrenalin or ephedrine should not be given because they stimulate the sympathetics and thus have a tendency to neutralize or offset the effect of spinal block. Therefore, intravenous saline or glucose should be given to counteract the fall in blood pressure.

5. Decompression by nasal suction catheter. In reviewing the literature on ileus of the past seven or eight years, it is interesting to note the influence that Wangenstein has exerted in the treatment of this condition in advocating the use of the inlying duodenal tube. When his first papers appeared describing this form of therapy,

contemporary writers were discussing the merits of single and multiple enterostomies, ileocolostomies, gastric lavage and various drugs. Since that time the use of the nasal suction apparatus as the method of choice in treating paralytic ileus has, in general, superseded all other forms of therapy. The value of its use in competent hands can best be pointed out by citing the experience of Wangenstein, who states that since 1931 when suction first began to be widely employed at the University of Minnesota Hospitals in the treatment of distention, no patient with paralytic ileus has been subjected to operation for its relief. The long double-lumened, balloon-tipped intubation tube, developed by Miller and Abbott in 1934, is a further advancement in the treatment of ileus by decompression. By means of this tube it is possible to decompress the entire small bowel.

Summary of Treatment

Prophylactic

1. Proper preoperative care, including mental preparation. Avoid the use of cathartics.
2. During a laparotomy avoid traumatizing the bowel and exposing it to air. Maintain good hemostasis.
3. After operation, withhold fluids by mouth until nausea and vomiting have subsided. Application of heat to abdomen is advantageous.
4. Proper sedation. Morphine is very useful. It increases the tone of the bowel and promotes intestinal activity.

Active Treatment

1. Prevent dehydration and starvation and maintain the body chemistry. Hypertonic saline solutions replace chlorides and stimulate peristalsis. Glucose solutions should be given intravenously, "covered" by insulin.
2. Drugs to stimulate activity of intestine should be used with discretion. Eserin is somewhat dangerous. Prostigmin and pitressin are probably most useful.
3. Enterostomy is seldom necessary.
4. Spinal anesthesia is often effective in promoting intestinal motility. When used, three-fifths the anesthetic dose is recommended. Intravenous glucose or saline, instead of adrenalin or ephedrine, should be given to combat the drop in blood pressure.
5. The nasal suction catheter is our mainstay in the treatment of paralytic ileus.

EPISIOTOMY

Description of a New Instrument for Presuture Method

JOHN T. LELAND, M.D.
Herman, Minnesota

The presuture method in episiotomy or the placement of sutures before episiotomy is performed, has long been advocated, but the technical difficulties involved have made the method unpopular. The need for further anesthesia for repair of an episiotomy results too often in the

cous membrane. As each suture is drawn through, it is cut, leaving long ends, the last one being double. With the sutures inserted and their ends grasped with forceps, the perineum is cut, the scissors following the groove of the instrument.

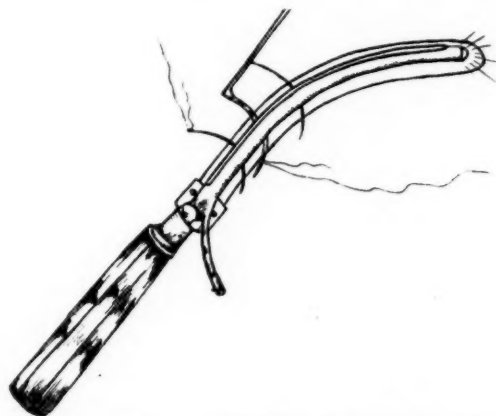


Fig. 1. Drawing of instrument, with electric attachment, showing relations of needles between tube and spatula.

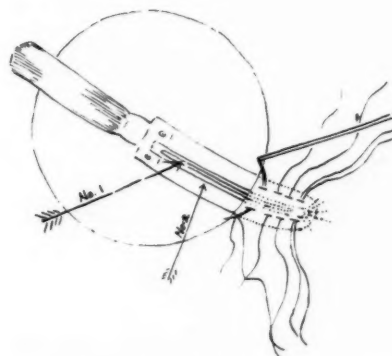


Fig. 2. Drawing of instrument, with battery in the handle, showing application. No. 1 is the groove along which the scissors are guided in making an incision. No. 2 is the tube attached at the proximal end under which the needle is passed.

omission of this valuable procedure. As an incentive for more general use of episiotomy by the general practitioner, who so often suffers from lack of trained assistants and proper illumination, an instrument is offered.

This instrument consists of a spatula-like blade, curved to conform to the infant's head, on the convex surface of which lies a curved rod attached only at the proximal end. The needle is directed underneath the rod, which is grooved for directing the scissors.

The instrument is inserted when the perineum is moderately distended at the time when episiotomy is indicated and pressure of the oncoming head or downward pressure by the operator produces an elevated outline, which facilitates the introduction of the sutures.

The sutures, threaded on a curved cutting needle carrier, are introduced through the intact perineum and beneath the tube, which acts as a guide, beginning at the junction of skin and mu-

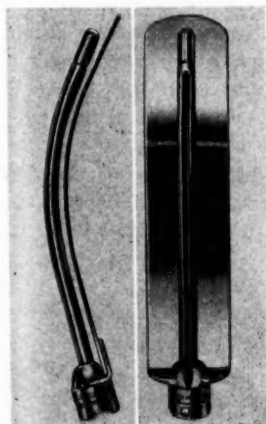


Fig. 3. Side and front views of the blade of the instrument.

The skin, urogenital septum, constrictor cuni, transversus perinei and some fibers of the puborectal portion of the levator ani are sev-

ered, resulting in a triangle-like incision with its base in a mid-lateral direction from the vulvar outlet.

In the final tying, the first or vagino-dermal stitch is used as a retractor while the depth of the incision is inspected. The deep muscles are approximated by an internal stitch, using one of the double strands previously inserted, which constitutes a "spare," carried where it is conveniently available. The stitches are now tied from below upward to complete the operation.

To remember that one's stitches are placed and held by forceps no matter what possible complication may be encountered is very consoling.

The instrument may be used without the services of an assistant. There is no need for

extending the anesthetic. There is no interference in the repair by untimely expulsion of the placenta. Time can be taken for resuscitation of the baby or meeting any other emergency, with the knowledge that the repair of the perineum only requires the tying of already placed sutures.

NOTE—The instrument has proven of value in cholecystectomy as a retractor and illuminator and in carrying a ligature. It is also of use as a retractor in inspecting the bed of the tonsil after a tonsillectomy.

The instrument is manufactured with battery in the handle,* in which case it is sterilized in lysol solution, wrapping the handle in a sterile towel; and with electric attachment, which instrument can be boiled.

*Manufactured by the Welch Allyn Company.

OCULAR TUBERCULOSIS—ITS SIMILARITY TO LEPROSY*

JOHN J. PRENDERGAST, M.D.
Saint Paul, Minnesota

THIS paper is not presented in order to stimulate undue interest in such a rare condition as ocular leprosy. Recently, I made a statistical study of leprosy of the eye under the sponsorship of the Public Health Service and I was struck with the apparent resemblance of the gross and microscopical ocular lesions to those of tuberculosis. Accordingly it is my aim to recapitulate our present-day knowledge of tuberculosis of the eye and call to mind its close relationship to leprosy.

Many writers have called attention to the similarity between the generalized lesions of leprosy and tuberculosis but, due to the comparatively few who have investigated the ocular lesions of lepers, this analogy has not been seriously stressed.

The diagnosis of tuberculosis of the eye is still a much disputed question. We in this country, and especially in our section of the country, still emphasize focal infection as the cause of most of our doubtful and smouldering intra-ocular infections. This tendency, however, is much less today than it was twenty or thirty years ago, due largely to painstaking investigations by Ger-

man oculists and several in our country. Nevertheless, we are still puzzled as to why 50 per cent of uveitis cases in Austria and Germany should be diagnosed as tuberculous as against about 10 per cent in the United States. Kronfeld³ and Woods⁴ are of the opinion that many of the minimal roentgenological and physical lung findings in Germany would be considered normal by American internists. The universally accepted opinion, however, seems to be that ocular tuberculosis is secondary to some remote tuberculous foci which are usually located in the peribronchial glands and that the infection travels to the eye by means of the blood stream.

It would not seem necessary to call to mind all of the signs and symptoms of a tuberculous uveitis with which no doubt we are all familiar. Lloyd⁴ summarizes the principal features as:

1. Limitation of process to part of the eye involved.
2. Tolerance of the eye to the process without pain or undue redness.
3. Sharpness or insidiousness of onset.
4. Its chronicity and tendency to relapse.

Woods⁴ warns that we must consider:

1. The character and course of the eye lesion

*Read before the Minnesota Academy of Ophthalmology and Otolaryngology, Saint Paul, Minnesota, March 10, 1939.

and the correlation of this with other similar lesions previously shown to be tuberculous by histological examination.

2. The exclusion of other possible etiological factors.

3. A study of the general tuberculous status of the patient.

4. The reaction of the patient to tuberculin.

Many of us are no doubt guilty of occasionally disregarding these signs and precautions in attempting to diagnose ocular tuberculosis and attach entirely too much significance to the skin tests, in spite of the fact that we are aware that a positive reaction to more than .001 mg. of tuberculin means nothing, and even this positive reaction only signifies a previous tuberculous infection or rather "hypersensitivity" of that particular patient. Werdenberg,⁷ in his recent review of ocular tuberculosis, states that the diagnosis remains only "probable" as long as no tubercle bacilli have been found and the tuberculin test can be used only with reference to the general pathologic picture. It is generally recognized that the majority of patients, however, with a *clinically diagnosed* tuberculosis of the eye will react positive to .001 mg. of tuberculin. King of Boston in a recently read paper reported 70 per cent positives out of a series of 1,350 patients of this type. Friedenwald and Dessoff's¹ percentage of positives is slightly lower than this in their *clinically* and *histologically* diagnosed cases and they brought out the very interesting fact that between 40 and 47 per cent of this series failed to react to stronger dilutions than .001 mg. of tuberculin and thus resembled normals. We can therefore understand the need of a ratio between cutaneous and ocular sensitivity in tuberculin diagnosis and therapy as the only indicator we have, at present, is the cutaneous. There is and has been research work along this line lately.

In view of the unreliability of the diagnostic skin tests in tuberculosis, we are forced to look upon any smouldering recurrent and resistant eye condition as "possibly tuberculous" in origin; this, of course, after we have completed thorough foci investigation.

It might be well to mention here that "Purified Protein Derivative" of the tubercle bacillus, as isolated by Seibert⁵ and approved by the American Council on Tuberculosis, is at present being preferred by many men for diagnosis. Also that

the much recently publicized Gruskin² diagnostic test is being viewed with some skepticism by some of our local internists.

There are no diagnostic skin tests in ocular leprosy, but the diagnosis is easy as the disease has usually progressed for some time before the eye is attacked. Both tuberculosis and leprosy affect almost any portion of the eye or adnexa. Both are caused by remarkably similar acid-fast organisms. The leper bacillus is slightly longer and more slender than the tubercle bacilli and usually exhibits no beaded appearance).

These bacilli reach the eye by means of the blood stream through a bacillemia which occurs at some time during the course of the disease. Tubercle bacilli might be hard to demonstrate in an eye lesion, but not so with leprosy, for thousands of them may be found in an ordinary sectioned cornea of leprous keratitis.

The Conjunctiva

Tuberculous and leprous involvement of the conjunctiva is rare. In an examination of 350 lepers I did not see a single involvement of the tarsal conjunctiva which I thought to be leprous. Tuberculosis of the tarsal conjunctiva usually occurs in the form of follicles or ulcers. These follicles, supposedly from movements of the lids, sometimes become elongated and pedunculated, thus producing the so-called "cock's comb excrescences." The ulcerative types sometimes result in polypoid formations. The bulbar conjunctiva also seems to be fairly immune from these diseases, except of course to participate in the underlying corneo-scleral involvement in both diseases.

Phlyctenulosis is usually primarily conjunctival and is thought to be closely allied to tuberculosis. Although no actual tubercle bacilli can be demonstrated in a phlyctenule, they are usually observed in persons with a tuberculous diathesis and are supposedly a response to tuberculin toxin.

The Cornea

The cornea is quite vulnerable to tuberculosis and leprosy, seemingly more so to the latter disease. It is almost always secondarily involved from the uveal tract. Deep infiltrations which usually emanate from above or from either side of the cornea, followed by an abundant meshwork of vessels, form the most characteristic

lesion. Pannus formation is also very common in leprosy and the studded appearance of this change is fairly typical and diagnostic. Posterior precipitates are common in both conditions and the usual end-result is a sclerosing keratitis. Tubercle bacilli are not commonly found in these corneal infiltrates but leprosy bacilli are plentiful.

The Sclera

Although scleral involvement by tuberculosis and leprosy have a striking resemblance, the scleral tissue proper with its closely packed fibers in general offers stiff resistance to the invasion of these acid-fast organisms, and by far the greatest number of lesions are seen at the corneo-scleral margin and in the episcleral tissues.

In a series of twenty-eight sectioned lepers' eyes, which I examined recently, no bacilli were found in the deeper layers of the sclera. Of course, the avascularity of this tissue may be a factor here.

The Uveal Tract

As may be expected in a tissue with an abundant blood supply, tuberculous and leprosy involvement of the iris, ciliary body and choroid are quite common, and in most cases the uvea forms the starting point of the diseases. The clinical picture in the iris is quite similar. Usually there is very little or no pain, a negligible amount of pericorneal and stroma injection, some "K.P." spots and posterior synechiae, and we may or may not observe tubercles or leprosy nodules in the stroma. Tuberculosis of the iris usually occurs in one of three forms.

(a) The usual chronic type in which one or several tubercles may be observed deep in the stroma, usually in the most vascular portions (pupillary or peripheral). Here we may also see "Koeppe bodies" at the pupillary fringe, which, although seen in this disease, contain no bacilli or giant cell systems and are thought by some to be an allergic manifestation like the phlyctenule, as their histologic appearance is quite similar.

(b) Miliary tuberculosis, in which small, gray, translucent tubercles exhibit themselves throughout the stroma, may be located deep or superficial.

(c) Conglomerate tuberculosis of the iris forms a large caseating mass usually coming from the angle of the anterior chamber. Types

"b" and "c" are not common. It is estimated that tubercles can be observed in about one-third of all iris tuberculosis.

Leprosy of the iris has a very insidious course and resembles the miliary form of tuberculosis in the later stages when numerous glistening white, pinpoint nodules collect on the surface of the iris, either uniformly or in clumps. However, these nodules, unlike tubercles, have a tendency to protrude from the surface and some may even seem to be pedunculated. There are many synechiae. Proliferation of iris pigment and atrophy of the stroma, especially around the pupillary portion, is quite marked.

Tuberculosis and leprosy of the ciliary body consist principally of infiltrations in the anterior and stromal parts, especially around the ciliary major which eventually lead to caseation, perforation and atrophy. Verhoeff states that anterior segment tuberculosis results from bacilli being carried here by the aqueous and vitreous as a result of an inward rupture of a tubercle through the epithelial layers of the ciliary body. This may be true of leprosy also, but I believe that the wandering corneal cells carry the bacilli to the peripheral parts of the cornea and thence throughout the stroma.

The Choroid

When tuberculosis of the choroid occurs in the posterior segment, the solitary tubercle often resembles a neoplasm. It usually forms near vessels and at first consists only of round cells; as it grows, however, caseation and giant cells appear microscopically and the lesion pushes forward, thins the pigment and appears ophthalmoscopically. Military tuberculosis of the choroid is fairly rare. Leprosy choroiditis likewise seems to be uncommon, despite the fact that bacilli can often be seen extending back through the pars plana of the ciliary body into the choroid with the microscope. In a fundus examination of 243 lepers, only fourteen lesions of the choroid or retinochoroid were observed and many of these I did not think directly due to leprosy.

Retina and Optic Nerve

Retinal tuberculosis consists for the most part in an endophlebitis or periphlebitis of the retinal vessels, especially the veins, in which a tubercle may form in the vessel wall or outside the vessel wall to involve the adventitia. This

CONVULSIONS IN CHILDREN—WYATT

subsequently leads to thrombosis, organization or aneurysmal dilatations, which in turn form intra-ocular hemorrhages and retinitis proliferans.

Van Lint⁶ recently demonstrated the fragility of vessels in pulmonary and ocular tuberculosis by using the "cuff method" to cause petechiae and strongly advised calcium and vitamins to prevent hemorrhage.

Many conflicting reports exist as to retinal lesions or hemorrhages in leprosy, but my conclusions were that they are very scarce. The optic nerve is practically immune to leprosy and tuberculosis.

Treatment

There is no recognized treatment for ocular leprosy, although many remedies have been tried. The usual systemic and hygienic pro-

cedures, coupled with the cautious use of tuberculin, offer the best results in tuberculosis. The actual administration and dosage of therapeutic tuberculin will not be discussed here other than to state that we usually prefer Denys bouillon filtrate. Werdenberg⁷ has stressed the value of high altitudes in conjunction with the other tuberculous therapy.

References

1. Friedenwald, J. S., and Dessoff, J.: The value of intracutaneous tuberculin test in diagnosis of ocular tuberculosis. *Bull. Johns Hopkins Hosp.*, 57:148, 1935.
2. Gruskin, B., Louria, A. L., and Bennett, R. H.: Intradermal test for determination of active tuberculosis. *Diseases of the Chest*, 4:22, 1938.
3. Kronfeld, P. C.: *Introduction to Ophthalmology*. Springfield: C. C. Thomas Co., 1938.
4. Lloyd, R. I.: Tuberculosis of the eye. *Am. Jour. Ophthalmol.*, 13:753, 1930.
5. Seibert, F. B.: Isolation and properties of purified protein derivative of tuberculin. *Am. Rev. Tuberc.*, 30:713, 1934.
6. Van Lint, A.: La fragilité des capillaires dans la tuberculose oculaire. *Arch. d'ophth.*, 1:691, 1937.
7. Werdenberg, E.: *Klin. Monatsbl. f. Augenh.* (suppl.) 94:1, 1935.
8. Woods, A. C.: Problem of ocular tuberculosis. *Am. Jour. Ophthalmol.*, 21:366, 1938.

CONVULSIONS IN CHILDREN WHILE UNDER GENERAL ANESTHESIA*

Report of Case

O. S. WYATT, M.D.

Clinical Assistant Professor of Surgery, University of Minnesota
Minneapolis, Minnesota

THE increasing frequency with which convulsions under general anesthesia are occurring in children, elicits this case report and brief résumé of the subject.

In view of the fact that about 85 per cent of these cases occur in children and young adults, we, who work with children, must be particularly concerned. The first reports appeared in the literature about 1927, and since then they have been occurring with such frequency that this alarming phenomenon demands the attention of all anesthetists, pediatricists and surgeons.

Case Report

The patient, an eleven-year-old white boy in perfect health, was awakened about midnight, January 11, 1939, with pain in the abdomen. He was seen early the following morning by Dr. David Siperstein, who made a diagnosis of acute appendicitis.

At the hospital the laboratory findings were: urine normal, white blood cells 17,500, polymorphonuclears

96 per cent (about 50 per cent being band forms). His temperature was 102.4.

Past history was negative except for an attack of infantile paralysis in 1935 from which he made a perfect recovery. He had never had an abdominal attack of pain like this before.

Physical examination revealed no abnormalities except for the abdomen, which presented the signs of acute appendicitis.

Preoperative medication consisted of a hypodermic administration of morphine sulphate gr. $\frac{1}{8}$ and atropine sulphate gr. $\frac{1}{300}$ at 7:30 a.m.

Anesthesia.—This was induced by nitrous oxide and maintained by ether administered by the drop method. While the child was being placed on the operating table the surgical supervisor remarked that the child felt much warmer than his temperature chart indicated. In retrospect, I suppose that his marked temperature elevation had already begun.

Operation.—The abdominal cavity was opened through a right rectus incision. No free fluid was present in the peritoneal cavity. The appendix was readily accessible and appeared acutely inflamed. It was removed in the usual manner with very little trauma. On section the lumen was filled with pus.

After the anesthesia had been in progress about 15 minutes the anesthetist reported slight cyanosis and

*Presented before the Northwestern Pediatric Society, Duluth, Minnesota, August 25, 1939.

observed twitchings of the eyelids. The pupils were dilated but reacted to light. On temporary withdrawal of the ether, the color returned to normal and the twitchings ceased.

The operation was completed without any further mishap, and the patient left the table with the usual postoperative appearance. The pulse during the operation ranged from 110 to 120. The operating time was thirty-five minutes.

The patient was returned to bed at 8:50 a.m. and appeared slightly cyanotic. His pulse was 150 and respirations thirty.

About twenty-five minutes after returning to bed the child had a terrific convulsion, became blue and presented marked carpo-pedal spasm. His temperature following the convulsion was 108.4. Heart sounds and respiration ceased during convulsion and never returned.

Etiology

Lundy reviewed the literature in 1937 and listed thirty-three causes which have been advanced to explain convulsions following anesthesia. A word regarding some of the more likely causes may be timely.

1. *Impurities in the Ether.*—The British investigators have been unable to prove this point. Ether impurities are: acetaldehyde, peroxides, ethyl sulphide, ketones, and alcohol. The first three are toxic if present to the extent of 0.5 per cent or more. They have analyzed the ether being used at the time of the convulsions on many occasions and have never found these impurities present in toxic doses. Woolmen and Taylor operated upon a child on a hot day, under open ether. A convulsion occurred and the anesthesia was discontinued. Following the convulsion, the anesthesia was continued with ether from the same bottle, with no further convulsions. They feel that ether, per se, or its impurities is not the cause of convulsions. They reported four cases in 1935, with a mortality of 50 per cent. They state that this condition is one of ether's most serious immediate dangers, but fortunately it is rare. However, I think we all agree that ether is by far the safest anesthesia in general use.

2. *Ether Convulsion Diathesis.*—Kemp suggested that there was such a thing as an "ether convulsion diathesis," maintaining that "if an individual develops tetany during an operation under anesthesia the same individual will again develop tetany if he is reoperated at a later date." Willway operated on a three-year-old child under ether who had convulsions but re-

covered. Forty-eight hours later when the child was more toxic he operated again under ether and no convulsions occurred.

The patient in this report had a tonsillectomy in 1936 under ether anesthesia with no untoward effects, and one is inclined to doubt Kemp's theory.

3. *Over-Etherization.*—Ashworth stated that in about 85 per cent of cases of ether convulsions the following factors are present: (1) the patient is under twenty years of age; (2) he is suffering from intense toxemia as a result of a septic local infection; and (3) the operating room is very hot. He maintains that the determining factor in the production of ether convulsions under these conditions is *deep* ether anesthesia.

Mennell, reporting eight cases, believed that over-etherization with over-oxygenation might be the cause. However, convulsions have occurred in cases where no oxygen has been used and in this case no oxygen was being used. This patient was in moderately deep ether anesthesia but the pupils still reacted to light.

Dr. Ralph Knight informs me that convulsions have occurred under every known general anesthesia. One case under cyclopropane is reported from the University of Minnesota.

4. *Excess of Carbon Dioxide in System.*—Pinson felt that this might be the cause. He reported fifteen cases with five deaths, all in children or young adults with acute infections.

Against this theory some British workers feel that carbon dioxide is the most effective agent in its treatment. Carbon dioxide not only removes ether from the body but also heat.

Seevers, Cassels and Becker, at the University of Wisconsin, working with rats, have shown the following:

	No. of rats	Convulsions or Twitch Per cent
Ether + pyrexia	24	0
Ether + CO ₂ (below 17%).....	24	21
Ether + Pyrexia + CO ₂ (7-12%)...	52	50
Ether + Pyrexia + CO ₂ (13-17%) ..	42	64

These authors have made clinical demonstrations which show that carbon dioxide given in sufficient concentrations will of itself cause convulsions.

Knight agrees with these workers and feels that carbon dioxide should never be used in the

treatment of convulsions, but that oxygen should be given freely.

5. *Anoxemia of Brain Due to Edema and Collapse of Lung Bases.*—Gwathmey feels that this may result from failure to use proper pre-anesthetic medication. It is true that edema of the lungs is the only constant post-mortem finding, but on the other hand we have been using morphine and atropine routinely as preoperative medication for many years and it is strange that no cases were reported before 1927.

6. *Atropine Over-Dosage.*—In many of the case histories that I have reviewed, a much larger dose of atropine has been used than is ordinarily given at our Children's Hospital.

I found in the literature instances of convulsions following anesthesia in which doses of from 1/150 to 1/75 grain of atropine were given children ranging from three to twelve years old. These are large doses of atropine and in these cases may have played a significant rôle in the convulsions.

Hornabrook, in criticizing Pinson, maintained that he was using too large doses of atropine in conjunction with ether. The ether, he maintained, was in no way to blame.

Hornabrook likewise reminds us that medical men fail to realize that the same dose of a drug cannot be given to a patient when under anesthesia as can be employed with possible safety in a patient who is not under that influence. He informs us that atropine is safer with chloroform than with ether.

Hornabrook, with thirty years' experience as an anesthetist, says that between five and twelve years of age the dose should be 1/12 gr. morphine and 1/200 gr. atropine; these doses mean safety. He states that the symptoms of atropine poisoning are "convulsions followed by paralysis, stupor at times, alternating with delirium, coma, and death preceded by heart failure and failure of respiration. Death is due to asphyxia."

7. *Acute Toxemia.*—MacKenzie feels that this is the essential and predisposing condition and that ether is the exciting agent. However, there are reports in the literature where a child suffering from acute toxemia developed convulsions during the first operation, and when operated a second time within a few days did not have convulsions.

8. *Heat.*—Woolmer and Taylor suggest that

ether upsets the normal heat regulating mechanism of the body and heat-stroke may play a big part in the etiology.

Willcox describes the hyperpyrexia from heat stroke as follows: "The onset may be sudden, with rapid rise of temperature, coma, and convulsions; the skin is hot and dry, face flushed and cyanosed; pupils dilated, fibrillary twitchings of the muscles and convulsions usually occur—pulmonary edema is a terminal event."

This description fits well with ether convulsions. All cases manifest hyperpyrexia. This boy immediately after his fatal convulsion had a temperature of 108.4.

9. Rosenow and Tovell suggest that this phenomenon may be due to a neurotoxin produced by streptococci which in the course of general anesthesia produce these convulsions.

Symptoms

The premonitory symptoms of this condition are always the same, and consequently should be a helpful guide in instituting early treatment.

Woolmer and Taylor reporting four cases in 1936 said, "The patient is a child or young adult with pyrexia, usually due to some septic condition. The theatre is over-heated. Atropine has been given and the dose may have been excessive. The patient is deeply anesthetized with ether, the pupils being dilated and inactive to light. The color is, as a rule, good and oxygenated ether is sometimes being given. The eyelids start to twitch, then the face, and the convulsions become general. In the immediately fatal cases after 5 to 10 minutes of convulsions, the respiration ceases, the patient goes blue, and the heart stops; in other cases, the convulsions stop, but the patient dies later from cardiac failure; alternatively, recovery may follow the cessation of convulsions."

In the non-fatal cases there is a tendency for the convulsions to cease in fifteen to twenty minutes. After the patient has returned to bed there may be a continuance of convulsions.

Treatment

The etiology of this phenomenon is certainly far from being settled; however, from the work that has been done, and a study of the literature, it is apparent that certain procedures are available to anesthetists and surgeons which, when properly used, may prevent a catastrophe.

CONVULSIONS IN CHILDREN—WYATT

TABLE I. SUGGESTED PRE-OPERATIVE MEDICATION

Age	Morphine	Atropine
18-15	1/8 gr.	1/200 gr.
15-12	1/12 gr.	1/300 gr.
12-9	1/16 gr.	1/400 gr.
9-6	1/20 gr.	1/500 gr.
6-3	1/24 gr.	1/600 gr.

Since these fatalities are becoming more common it is probably advisable that a soluble barbiturate be at hand for instant use whenever a child is being operated upon for an acute septic process, under deep anesthesia. This substance should be given intravenously at once if the patient shows any twitchings of the eyelids or about the mouth.

Wright, for a twelve-year-old boy, gave 3 gr. of nembital in 10 per cent solution intravenously slowly, and convulsions ceased abruptly.

Knight believes that a short-acting barbiturate such as evipal soluble or pentothal sodium should be given at first, and that if convulsions tend to recur, nembital or sodium amytal can be used for sustained action.

The British surgeons have demonstrated that chloroform inhalations will frequently control the convulsions; hence a can of chloroform should be in every operating room when a child is being operated for an acute septic process.

Oxygen is present in every well equipped operating room, ready for instant use, and should be given at once.

Cold should be immediately applied to the body and ice over the carotid regions.

Jackson advocates use of calcium gluconate in one grain dosage to check hyperirritability of the nervous system.

Adrenalin, which is an antiallergic, should be given at once. Adrenalin also mobilizes the glycogen reserve.

Sears reported a case in which convulsions ceased coincident with intravenous injection of 50 per cent dextrose, and suggested that the condition might be associated with hypoglycemia in children.

Gwathmey feels that we must be more careful in our preoperative medication and anesthetic agent.

I feel that our dosage of atropine should be regulated more carefully, particularly in hot weather, in view of the fact that the British report most of their cases occurring in hot weather.

TABLE II. TABLE DEVISED BY B. C. LEECH, REGINA, SASK., CANADA

Age	Morphine	Hyoscin
Up to 6 mo.....		1/1200 gr.
6 mo.-1 yr.....		1/900 gr.
1-2 yrs.	1/40 gr.	1/600 gr.
2-4 yrs.	1/32 gr.	1/600 gr.
4-8 yrs.	1/20 gr.	1/450 gr.
8-12 yrs.	1/16 gr.	1/450 gr.
12-16 yrs.	1/12 gr.	1/300 gr.

To be given by hypodermic injection forty-five to thirty minutes preoperatively.

Discussion

I feel that in order to attain still higher levels of safety in our surgical work upon children we must give some critical thought to our preoperative medication, anesthetists, and anesthesia.

In considering preoperative medication perhaps some changes are necessary in order to attain greater safety. Atropine has been routine in preoperative medication for a good many years and has become almost as well established as morphine. We should at least give smaller doses of atropine and I'm not so sure but that it should be dropped from our preoperative preparation when we are operating upon children for an acute septic process. Many of us have seen atropine cause a sharp temperature rise in children and perhaps therefore make them more susceptible to convulsions. Haggard, in his experimental work, proved that a rise in body temperature lowers the alveolar CO₂ tension and reduces the amount of CO₂ in solution in the blood. Since realizing that atropine occasionally causes these disturbances I have stopped using it and our anesthetists report that it does not make the administration of ether any more difficult. As far as I can tell, the anesthesia is as smooth without the atropine as it is with it.

With the twitchings, severe carpo-pedal spasms, and convulsions that these children have, perhaps a calcium disturbance plays some rôle in this picture. I wonder if calcium gluconate should be given intravenously thirty to forty-five minutes preoperatively. Personally I intend to discontinue the use of atropine until further investigative work has been done regarding it in respect to convulsions while under general anesthesia.

I think we must all plead guilty to having paid too little attention to our anesthetist and the type

of anesthesia being used. Our anesthetist must be more than just an anesthetist. He or she must understand children, be skillful in the administration of anesthetics to children, and be able to handle any emergency that may arise during the course of the anesthesia.

Henderson, from his vast amount of research work on respiration, tells us that the first principle of anesthesia is that the depth should be maintained as nearly uniform as possible. Depth should be attained as quickly as possible and the stage of excitement be as short as possible.

The disturbance of the CO_2 capacity of the blood under ether anesthesia appears to be wholly dependent on disturbance of respiration. If the anesthesia is managed so that the respiration is but little increased, the lowering of the CO_2 content of the blood is slight. Ether hyperpnea, however, causes a very great reduction in the CO_2 content of the blood and danger of an alkalosis. Light etherization loses this influence when administered with sufficient CO_2 to maintain the alveolar CO_2 at a normal level.

The supply of oxygen has relatively little immediate influence upon respiration. The administration of pure oxygen never acts as a stimulant. CO_2 , on the other hand, is the normal stimulant and regulator of breathing.

In quoting these facts from Henderson's work on respiration I hope to call your attention to the growing importance of the work which is being done in the field of anesthesia and to re-

emphasize the important rôle that anesthetics play in our work with children.

I believe we must be cognizant of these advances if we are going to bring greater safety to our patients during surgical procedures.

Conclusions

1. Convulsions under ether anesthesia are so unexpected and terrifying that we must have a definite plan of treatment agreed upon between anesthetist and surgeon.
2. Check temperature before anesthesia is started.
3. Adrenalin must be given instantly.
4. Soluble barbiturate must be on hand for instant use, whenever a child is being operated for an acute septic process.
5. Ether anesthesia must be stopped at once on appearance of premonitory symptoms.
6. Chloroform, oxygen, and carbon-dioxide must be readily available.
7. Calcium gluconate or dextrose (50 per cent intravenously) may be necessary to stop convulsions.

I have taken the liberty of calling this condition to your attention because of the fact that this phenomenon is on the increase and every individual who has anything to do with operative conditions in children must be prepared to meet this emergency.

308 Physicians and Surgeons Building.

INFLAMMATORY DISEASE OF THE THYROID GLAND*

THOMAS O. YOUNG, M.D., F.A.C.S.

Duluth, Minnesota

INFLAMMATORY disease of the thyroid gland can be defined as the resulting change in glandular structure produced by the action of a chemical, mechanical, or infectious process. It is characterized by lymphocytic invasion, and connective tissue proliferation, as well as other variable factors. Medical literature is filled with many excellent works pertaining to the various types of inflammatory diseases of the thyroid and their multitudinous phases. Such conditions become interesting, primarily because of the in-

frequency of their occurrence, the outstanding difficulty in recognizing them clinically, and finally because of the distinctive histological findings.

A logical classification of these conditions, Table I, will divide them into two groups with entirely different etiological factors. The first group consists of those cases in which the etiological factor is of a specific nature, while in the second group the reverse is true. Specific inflammatory disease of the thyroid includes tuberculosis, syphilis, actinomycosis, and echinococcus. All of these conditions are extremely rare

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minn., September 8 and 9, 1939.

THYROID GLAND—YOUNG

TABLE 1. INFLAMMATORY CONDITIONS OF THE THYROID GLAND.

Specific:

1. Tuberculosis
2. Syphilis
3. Actinomycosis
4. Echinococcus

Non-specific:

1. Thyroiditis:
 - A. Acute
 - a. Without abscess formation
 - b. With abscess formation
 - B. Chronic
2. Riedel's struma
3. Hashimoto's struma
4. Strumitis
5. Lymphocytosis and fibrosis (slight to moderate)

and proven cases are still reported in the literature according to the total number found and published. It is not within the scope of this paper to give these conditions detailed consideration, but rather to briefly mention them and state their outstanding characteristics.

Tuberculosis of the thyroid is rarely if ever diagnosed preoperatively. Usually there is no clinical evidence of tuberculosis elsewhere, though the type of thyroid associated with miliary tuberculosis should be mentioned. In the classical case there is usually a diffusely enlarged gland causing pressure symptoms and characterized by a hardness and firmness which at times may be almost stony in character. The ordinary symptoms of thyrotoxicosis are often present *i. e.*, nervousness, irritability, tachycardia, dyspnea, and loss of weight and strength. Pathological examination of the gland shows a diffuse fibrosis with tubercle and giant cell formation and round cell infiltration. Attention should be drawn to the fact that a considerable number of thyroid glands removed surgically show tubercle and giant cell formation without any evidence of tuberculosis elsewhere in the body. Most of these cases contain no demonstrable tubercle bacilli and cannot be considered as tuberculosis. Thyroidectomy in this group as well as in true tuberculosis serves to alleviate the symptoms from which the patient sought relief. Histological and bacteriological studies of the gland removed at operation are essential before a final diagnosis can be made.

Syphilis, causing localized symptoms in the thyroid, is very infrequent. It is quite generally conceded by some authors that the thyroid is more resistant to this infection than other tissues of the body. Involvement of the thyroid may be found associated with secondary manifestations

of the disease. It is characterized by a diffusely swollen, markedly congested, painful gland. The localized condition yields readily to the usual antiluetic treatment. Syphilis may be characterized by gumma in the thyroid both in early or late stages. Microscopically the gumma shows the usual necrotic center surrounded by fibrous tissue invaded with lymphocytes and rather rarely giant cells.

Actinomycosis and echinococcus cysts in the thyroid are mentioned only because of their extreme rarity. It is unusual for these to be found by an average medical practitioner during his span of life, and little in regard to them can be found among medical writings. The diagnosis is not made clinically but entirely from a pathologic standpoint.

The present study is primarily concerned with the non-specific types of inflammatory disease of the thyroid. These include acute thyroiditis, acute thyroiditis with abscess formation, chronic thyroiditis, Riedel's struma, Hashimoto's disease (struma lymphomatosa), chronic strumitis, and lastly the frequent microscopic finding in a large percentage of goiters removed in which a mild degree of connective tissue proliferation and lymphocytic invasion exists.

Acute thyroiditis without abscess formation frequently follows acute infections elsewhere in the body. Such conditions as abscessed teeth, acute tonsillitis, and acute upper respiratory tract infection being the most common. Tenderness and swelling of the thyroid is present and is accompanied occasionally by dysphagia and usually by low grade fever. McQuillan states that the involvement of the thyroid may be localized or diffuse. At some period during the acute process varied manifestations of low grade hyperthyroidism may develop with metabolisms ranging as high as +30. Usually this condition is self limited and treatment with rest, salicylates, iodine, and heat is sufficient to promote a gradual diminution in symptoms. However, if response to this treatment is lacking, partial thyroidectomy should be done. Occasional myxedema follows acute thyroiditis.

Acute thyroiditis with abscess formation is a considerably more difficult and delicate therapeutic problem. Hertzler emphasizes the "terrible viciousness" that this form may attain. It may occur either in a normal or goitrous gland and like the non-suppurative forms, it frequent-

ly follows acute infections elsewhere in the body. Treatment consists in adequate drainage through proper exposure as soon as the diagnosis can be established. A common error is the failure to establish adequate drainage which frequently necessitates further operation.

Chronic thyroiditis may be defined as an inflammatory process of low grade involving the thyroid gland. It is recognized usually post-operatively from a histological examination of the specimen removed. Culture of the specimen characteristically is negative and shows no bacterial invasion. In a study of 100 cases, Wallis divided them into three groups; (1) those having ordinary signs of goiter without thyrotoxicosis or inflammatory process; (2) those having low grade signs of inflammation such as recent swelling and tenderness; and (3) those where symptoms of thyrotoxicosis are predominant. There seems to be a definite predisposition in women as his series showed a predominance of 85 per cent. The pathological findings vary from a marked lymphocytic infiltration with connective tissue proliferation and destruction of thyroid follicles to the more moderate forms which may not be deemed of sufficient importance by the pathologist to be worthy of mention as thyroiditis. In these chronic types, the evidence points to an infectious or mechanical source as the etiological factor but, as stated previously, culture of the specimens is almost always negative. The treatment is essentially surgical, partial thyroidectomy being the operative procedure of choice. Hypothyroidism of varying degrees may result and is dependent both on the severity of the inflammatory process and the amount of thyroid tissue left intact by the operator. Eberts and Fitzgerald differentiate chronic infectious processes in the thyroid according to the presence or absence of goiter. When the lymphocytic infiltration involves one or more nodules, they feel that it should properly be called strumitis in contrast to thyroiditis which is found only in what was apparently a previously normal thyroid. The microscopic evidence of inflammatory process is essentially the same whether found in goitrous or non-goitrous tissue and its treatment the same. However, it is a quite generally accepted view that goiter predisposes to inflammatory conditions in the thyroid and that the susceptibility is definitely greater than that of the normal gland.

Granting that this conception of differentiation of the diagnoses is correct, then obviously many diagnoses of chronic thyroiditis which have been made should have been chronic strumitis.

In 1896, Riedel first reported in the literature two cases of unusually severe inflammatory disease of the thyroid, since known as Riedel's struma. The two cases reported showed extreme induration and fixation of the gland. At operation extra capsular extension, marked adhesions to surrounding structures, and actual infiltration of vessels was found. Since this time, other cases have been reported from time to time, but definite, pathologically proven cases still remain a rarity. In 1936, Lee reported ninety cases of proven Riedel's struma culled from the literature and commented on the differential diagnosis. The condition is usually found in young to middle aged adults, the sex about equally divided, though some authors feel that there is some predisposition to this condition in the female. About 35 per cent give a history of pre-existing goiter. The disease may be unilateral or bilateral, the region involved varying from the size of a pea to the entire thyroid and surrounding structures. Clinically, a diagnosis of malignancy is made in about 90 per cent of cases. Usually these cases are characterized by dysphagia, dysphonia, swelling, and tenderness, with occasional symptoms of mild hyperthyroidism. The average metabolism in the series reported by Eisen was +10. Treatment is universally surgical and has varied from biopsy to partial thyroidectomy though the latter should be done where possible. The color of the gland varies from yellow to gray to pink. A histological study shows infiltration with lymphocytes and marked connective tissue proliferation with hyalinization. Pseudo-giant cells are usually present and may frequently be seen ingesting colloid material. A marked destruction of acini is quite apparent. Relief from surgical treatment is quite constant but according to various authors hypothyroidism follows in from 20 to 40 per cent of cases.

In 1912, Hashimoto reported four cases of diffuse lymphocytic infiltration of the thyroid. This became known as struma lymphomatosa and was at first considered a stage or form of Riedel's struma. Recent writers on this subject, however, agree that this is not the case, and that it exists as a distinct clinical and pathological entity. Graham in 1937, established its in-

THYROID GLAND—YOUNG

TABLE II. DIAGNOSES IN 26 CASES OF INFLAMMATORY DISEASE OF THE THYROID FOUND IN 2900 THYROIDECTOMIES.

(16 patients operated upon)

	No. Cases	Operated	Not Operated
Chronic thyroiditis	12	8	4
Acute thyroiditis	7	3	4
Abscess of thyroid	4	3	1
Tuberculosis of thyroid	1	Post	
Riedel's struma	1	1	
Hashimoto's struma	1	1	

dividuality by clearly differentiating the clinical and pathological findings. Briefly this condition is found 100 per cent in the female and in middle aged or old adults. It is always a bilateral diffuse involvement of the thyroid from

the literature available failed to show any attention to this type of chronic inflammatory condition. It may occur to varying degrees in normal glands, diffuse, or diffuse toxic goiters, and in nodular, or nodular toxic goiters. The gland of this type usually has a slight to moderate infiltration with lymphocytes and slight to moderate connective tissue proliferation. Associated with it are occasional colloid changes such as variation in staining qualities and various degrees of vacuolization. Pathologists' reports vary as to their recognition of this condition and as to the emphasis they place upon it. It is usually not present in sufficient amounts to be classified as a thyroiditis or strumitis, but rather as coin-

TABLE III. DETAIL REGARDING 26 CASES OF NON-SPECIFIC INFLAMMATORY DISEASE OF THE THYROID

	Acute Thyroiditis	Chronic Thyroiditis	Abscess	Riedel's Struma	Hashimoto's Struma
Average age	46.2	49	16.2	56	49
Males	1	4	2	1	0
Females	6	8	2	0	1
Acute infection preceding	3	0	1	0	
Average duration	35 days	195 days	7.2 days	60 days	15 days
Operation	3	8	4	1	1
X-ray	0	2	0	0	0
Medical treatment	4	2	0	0	0
Pain	2	3	4	1	1
Tenderness	2	3	4	1	0
Swelling	2	2	4	1	1
Pressure	2	3	3	1	0
Toxic symptoms	2	3	0	1	0

the onset. The duration of symptoms varies from one to two years, and about 20 per cent show evidence of hyperthyroidism. Seventy-five per cent of these cases develop hypothyroidism postoperatively and it is occasionally found before operation. In contrast to Riedel's struma there is no involvement of adjacent structures adding to the technical difficulties of the operation. Pathologically the most prominent feature is a diffuse lymphocytic infiltration with formation of lymphoid follicles having active germinal centers. There is also an increase in connective tissue which seems to be a replacement fibrosis. However, this is much less in quantity and more delicate in formation than in Riedel's struma. The acini show considerable degeneration and crowding out by the lymphocytic infiltration.

The last group which should be emphasized receives scanty consideration in the literature and is usually mentioned by pathologists only as an incidental finding. These cases are found in vast numbers in operative specimens diagnosed solely as some type of goiter. Careful search of

incidental and having no particular significance. The frequency of this finding in goiters where no clinical evidence of inflammatory process existed leads to speculation as to the possibility that this pathological evidence of low grade inflammation may be a primary causative factor

TABLE IV. PATHOLOGIC FINDINGS IN 16 CASES OF INFLAMMATION OF THE THYROID.

	Acute Thyroiditis	Chronic Thyroiditis	Riedel's Struma	Hashimoto's Struma
Lymphocytic infiltration	3	9	1	1
C. T. proliferation	3	8	1	1
Giant cells	1	3	1	1
Tubercles	1	0	0	0
Epithelial degeneration	1	0	0	0
Destruction of acini	1	5	1	1

in bringing the patient to the point of seeking relief. It is difficult to offer definite proof that this low grade condition should assume more importance in our clinical and pathological analysis.

THYROID GLAND—YOUNG

However, a follow-up of a considerable group of these cases revealed a high percentage of cures, indicating that a possible relationship existed between these findings and low grade toxicity.

It is the belief of the writer that pathologists

Hospital, the following terminology was agreed upon as conveying to the surgeon or internist a concise understandable diagnosis. For example, such a diagnosis might read: Nodular Goiter with Hyperplasia II, Lymphocytosis II,

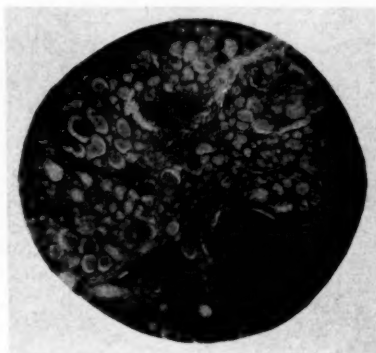


Fig. 1. Chronic thyroiditis showing marked connective tissue proliferation with hyalinization and extensive destruction of acini.

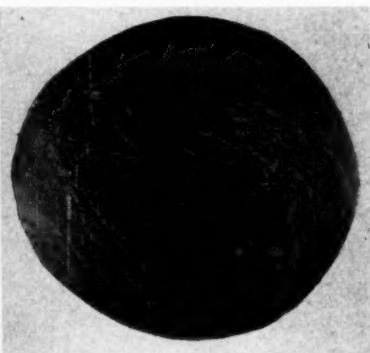


Fig. 2. Acute thyroiditis. Quite marked lymphocytic invasion with crowding out of thyroid follicles.



Fig. 3. Moderate degree of lymphocytic infiltration and connective tissue proliferation in low grade diffuse toxic goiter. This finding is quite universally disregarded.

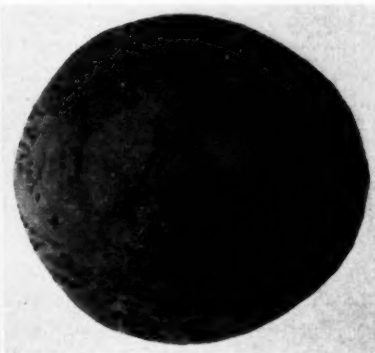


Fig. 4. Giant cell, ingesting colloid, surrounded by dense fibrous tissue.

should make a definite effort to include this finding in their report and that some term defining such a finding and having diagnostic significance should be used. Obviously they should not be called thyroiditis or strumitis, as these terms are applied to the more extensive and severe forms. The terminology used should be brief and to the point and convey a definite, understandable picture of the pathology found. Considerable thought and study have been given to devising a diagnostic terminology which would fill all the above qualifications. After discussion with Dr. Arthur H. Wells, pathologist at St. Luke's

Fibrosis I, or Diffuse Goiter with Hyperplasia IV, Lymphocytosis I, Fibrosis II. The value of the additional information conveyed should induce pathologists, surgeons, and internists to consider the advisability of using a uniform terminology of this or similar nature.

In addition to a review of the literature a study was made of all cases diagnosed as some form of inflammatory disease of the thyroid at St. Luke's and St. Mary's Hospitals during the past fifteen years. In this period 2,900 thyroidectomies were performed and out of this group only twenty-six cases or 0.8 per cent

THYROID GLAND—YOUNG

were diagnosed as inflammatory lesions. In this series ten were diagnosed as chronic thyroiditis; seven, acute thyroiditis; four, abscess of the thyroid; one, tuberculosis of the thyroid; and one each of Riedel's and Hashimoto's struma.

plained of choking and two had fever. The pathological specimens both showed lymphocytosis and fibrosis, and one contained giant cells, tubercles, and showed epithelioid degeneration.

There were four cases of abscess of the

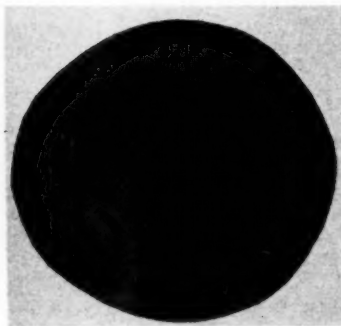


Fig. 5. Riedel's struma. Almost total destruction of thyroid acini by dense proliferating hyalinized connective tissue.

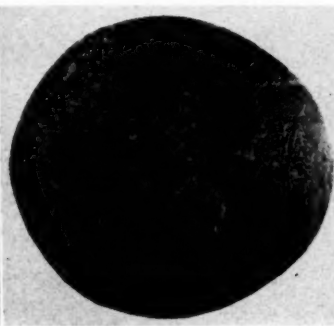


Fig. 6. Hashimoto's disease. Dense severe lymphocytic invasion with practically total obliteration of thyroid tissue. Formation of germinal centers is evident.

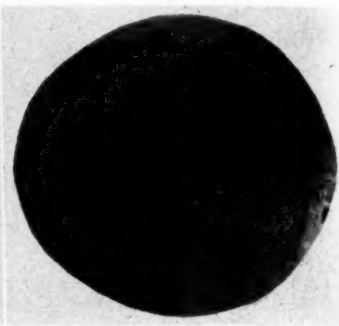


Fig. 7. Postmortem thyroid with total weight of 10 grams. Almost complete destruction of acini. Lymphocytic invasion. Connective tissue proliferation and deposit of fat globules.

There were seventeen females and nine males in the group. Sixteen patients were operated upon, two treated by x-ray, and the remainder were given medical treatment.

A brief résumé of the findings according to the type of pathologic lesions found was of interest. Of the twelve cases of chronic thyroiditis eight were females and four males with an average age of forty-nine. The average duration of symptoms, as was to be expected, was long and amounted to 195 days. In this group thyroidectomy was performed in eight cases, x-ray treatment in two, and two were treated medically. There was no history of preceding acute infection. The symptoms were quite evenly divided, the predominate ones being pain, pressure, tenderness, enlarged thyroid with mild symptoms of toxic goiter. Of the eight specimens removed all showed fibrosis and lymphocytic infiltration, three showed giant cell formation, and two definite destruction of the acini.

Seven cases were diagnosed as acute thyroiditis, six being females and one male. The average age was forty-six years and the duration of symptoms thirty-five days. An acute infectious process preceded the onset in three instances: one, impetigo; one, acute tonsillitis; and one, acute upper respiratory infection. The predominate symptoms were pain, swelling, and symptoms of thyrotoxicosis, while two com-

plained of choking and two had fever. The pathological specimens both showed lymphocytosis and fibrosis, and one contained giant cells, tubercles, and showed epithelioid degeneration. There were four cases of abscess of the thyroid: two male and two female with an average age of sixteen years. One patient had an abscessed tooth the week preceding. The average duration of symptoms was seven days while those most predominate were pain, tenderness, localized swelling and temperature. All cases were treated by incision and drainage followed by hot boric packs. One case was drained four times, one two, and the others one each.

There was one case of Riedel's struma in a male, aged fifty-six. Symptoms had been present for two months and consisted of hoarseness, difficulty in swallowing, definite diffuse enlargement of the neck, accompanied by symptoms of early thyrotoxicosis. At operation infiltration into surrounding structures was found to be present to a moderate degree. The specimen showed markedly severe connective tissue proliferation with hyalinization and destruction of acini. There were many atrophic follicles, and the presence of giant cells was noted.

The case of Hashimoto's struma (struma lymphomatosa) was a female, aged forty-nine, with symptoms of swelling of the neck, slight dysphagia, tenderness and pain present for about one year. The metabolism reading was -16. At operation a diffusely enlarged thyroid was removed without difficulty. The specimen showed moderate connective tissue proliferation,

marked lymphocytic infiltration throughout with germinal centers, giant cells and tremendous destruction of acini. The metabolism six months later had dropped to —36.

The case of tuberculosis in a male, age nine, was diagnosed by autopsy specimen in a patient dying from pulmonary tuberculosis. There was no suspicion before death that the thyroid was involved but pathological specimen showed giant cells, tubercles, and tubercle bacilli.

Another autopsy specimen is worth briefly reporting at this time. A male, age sixty-one, weighing 350 pounds, was brought to the hospital with acute heart failure and died in three hours. In this case the thyroid was removed in toto and weighed 10 grams. Microscopic sections showed marked acinar destruction and replacement with fibrous tissue and infiltrating lymphocytes. Only scraps of colloid could still be found. The additional meager data of tremendous weight, heart failure and undoubtedly marked hypothyroidism definitely classify this case as a severe chronic thyroiditis.

Conclusions.—A review of the literature and twenty-six cases of recognized inflammatory diseases of the thyroid emphasizes the infrequency with which such conditions occur and that the most successful treatment in the majority of cases is surgical. The importance of recognizing evidence of primary or secondary inflammatory processes of lesser degree occurring in all types of goiter is emphasized and a concise manner of reporting pathological diagnoses including these inflammatory changes suggested.

Summary

Twenty-six cases of inflammatory disease of the thyroid occurring in 2,900 consecutive thy-

roidectomies have been reviewed and important points of diagnosis emphasized. Sixteen of these patients were treated surgically, two by x-ray, and eight by medical management. Two autopsy specimens were included in the eight treated medically. Results in those treated surgically were good. There was a high percentage of hypothyroidism in this group, as was to be expected.

Bibliography

- Behrend, M.: Abscess and gangrene of the thyroid gland. *Surg., Gyn. & Obst.*, 39:293, 1924.
- Cattel, R. B.: A practical classification of thyroid diseases. *Surg. Clin. No. Am.*, 16:1499, (Dec.) 1936.
- Clute, H. M., Eckerson, E. B., and Warren, R. S.: Clinical aspects of struma lymphomatosa (Hashimoto). *Arch. Surg.*, 31:419-428, (Sept.) 1935.
- Clute, H. M., and Lahey, F. H.: Thyroiditis. *Ann. Surg.*, 95:493-498.
- Eisen, David: Riedel's Struma. *Am. Jour. Med. Sci.*, 191-2:673-687.
- Fernandez, Lopez Fernandez and Fusté, Ricardo: Bocio de Riedel. *Tr. Am. Assn. Study Goiter*, 1938-220.
- Graham, A.: Riedel's struma in contrast to struma lymphomatosa (Hashimoto). *West. Jour. Surg.*, 39:681-689.
- Hertzel, Arthur E.: *Surgical Pathology of the Thyroid Gland*. Philadelphia: Lippincott, 1936.
- Jaffa, R. H.: Tubercle-like structures in human goiters. *Arch. Surg.*, 21:717-728.
- King, B. T.: Thyroiditis. *West. Jour. Surg.*, 41:391-398, (July) 1933.
- Kirshbaum, J. D., and Rosenblum, A. D.: Suppurative intrathoracic thyroiditis. *Arch. Surg.*, 36:867, 1938.
- Lee, M. A., and McGrath, E. J.: Struma lymphomatosa (Hashimoto). *Surgery*, 2:238, 1937.
- Lehman, James A.: Hashimoto's struma. *Tr. Am. Assn. Study Goiter*, p. 237, 1938.
- McClintock, J. C., and Wright, A. W.: Riedel's struma and struma lymphomatosa (Hashimoto). *Ann. Surg.*, 106: 11.
- McQuillan, Arthur S.: Thyroiditis. *Tr. Am. Assn. Study Goiter*, 212, 1938.
- Senechal, F. E.: Gummosis syphilis of the thyroid gland. *Am. Jour. Med. Sci.*, 155:691, 1918.
- Schulman, E.: Syphilis of the thyroid gland with special reference to exophthalmic goiter. *Internat. Clin.*, 4:126.
- Shaw, B. A. F., and Smith, R. P.: Riedel's chronic thyroiditis. *Brit. Jour. Surg.*, 13:93, (July) 1925.
- Smith, L. W., and Clute, H. M.: Chronic ligneous thyroiditis (Riedel's Struma). *Am. Jour. Med. Sci.*, 172: 203, 1926.
- Smith, L. W., and Leech, J. V.: Tuberculosis of the thyroid gland. *Surg. Clin. No. Am.*, 8:185, 1928.
- St. George, A. V.: Chronic productive thyroiditis. *Ann. Surg.*, 80:25, 1924.
- Wallis, Alfred E.: Chronic thyroiditis. *Arch. Surg.*, 33: 545-553, 1936.
- William, C. W., and Sternberg, B.: Gumma of the thyroid. *Surg., Gyn. and Obst.*, 38:781, 1924.
- Young, Thomas O.: Chronic hyperthyroidism. *Surgery*, 4:111-123, (July) 1938.

CRITICAL CREOSOTE CRITERIA

The report of the Council on Pharmacy and Chemistry of the American Medical Association (J.A.M.A., 110:209, Jan. 15, 1938) indicated that creosote and its allied preparations have received more promotion and widespread application in the past than is warranted by the available pharmacologic evidence. The Council therefore omitted all such preparations from New and Non-official Remedies because they are marketed without satisfactory evidence that they have sufficient therapeutic value and their use is based entirely on empiricism. E. J. Fellows, who previously reported three studies of a series, now reports a critical study of the effect of orally administered calcium creosotate on the twenty-four hour sputum of patients with pulmonary tuberculosis. In spite of the fact that estimations of the volatile phenols excreted in the urine of patients who received the highest oral doses of the drug indicated

adequate absorption, significant change in either the sputum phenols or sputum volumes was not observed in any of the cases during the period of calcium creosotate administration. The author also investigated the expired air of animals given the drug. Observations on six rabbits revealed that phenolic material was not present in their expired air during a period of eight to eighteen hours after each animal had been given 0.5 Gm. of water-soluble calcium creosotate phenols by stomach tube. The results of the entire study not only invalidate the reports of other workers who attempted to establish a rationale for creosote compounds in pulmonary disorders on the basis of change in the expired air during administration of such drugs but also disprove previous claims for symptomatic relief because of the increase in expectoration and appetite or lessening of cough. (J.A.M.A., Nov. 11, 1939, p. 1815.)

NASAL OBSTRUCTION: IS IT ALLERGIC?*

C. L. OPPEGAARD, M.D., F.A.C.S.

Crookston, Minnesota

THE ever widening field of medicine and surgery today makes it imperative for many to limit their knowledge to special regions of the body. Increasing application of this knowledge tends to enlarge the field of each specialty. This makes it necessary to have a more thorough understanding of phenomena which may have local manifestations, and in addition may affect remote regions of the body. This is never more true than in the field of allergy. No specialty is exempt from its capricious effects, and thus no specialist can afford to disregard its presence, but should acquire some knowledge of its etiology, diagnosis, and treatment. To the general man whose daily work touches upon all fields of medicine and surgery, it adds one more link to his ever widening horizon. The pendulum must not swing too far, however, for if it does, we may develop an allergic phobia which may prevent the proper treatment in a given surgical or medical case.

Affecting as it does every field of medicine, we, who limit ourselves to a specialty, feel justified in calling to your attention certain characteristics of this phenomenon as it affects our particular field, which may render clues to the proper treatment of corresponding conditions in other fields. The purpose of this paper is not to attempt to bring anything new into this already complex field of allergy, but to emphasize the fact that the cases of nasal obstruction you see may be allergic. The time is not far distant, we believe, when every case of nasal obstruction, either acute or chronic, should be declared guilty of allergic tendencies until proved innocent. This thought is not any more radical than the emphasis placed upon every bellyache as being one of an acute appendicitis until proved otherwise. For the purposes of this paper, when we refer to nasal obstruction, we mean to imply an obstruction of any degree and of sufficient moment to bring the patient to see you about its correction, or of sufficient moment to cause comment by the patient of its presence. When we refer

to allergy as it affects the nose, we are not referring just to seasonal hayfever, but to its many manifestations in the nasal structure.

The term allergy as used in the scientific sense is full of controversial meanings. As we are interested primarily in one clinical phase, we like the definition of the term as given by Ellis² in which he states that "allergy indicates a constitutional state whereby an individual reacts specifically and exhibits characteristic symptoms in response to substances which to normal individuals in like amounts are harmless and innocuous." Allergy and the term hypersensitiveness are used synonymously in clinical medicine, and rightly so, but they should not be confused with the term intolerance. The latter term, according to Ellis² "is used to designate the state or condition of an individual who responds to ordinary amounts of a substance in an exaggerated manner, but without characteristically different symptoms or physiological effects." To understand the reaction in allergic manifestations, the concept of the shock organ and shock tissue is necessary. It brings about a better understanding of the production of diverse conditions such as hayfever, asthma, eczema, urticaria, angioneurotic edema, allergic rhinitis, gastro-intestinal disturbances, and in many instances migraine, from contact with one and the same allergen. "Concerning shock tissue we have much to learn. That it is the same in anaphylaxis in animals and clinical allergy is extremely doubtful. In anaphylaxis, it appears to be chiefly, if not entirely, smooth muscle tissue—in the case of human allergy, the reaction in most of the major phenomena is almost always edema and not a result of smooth muscle contraction." "The anatomical location of the sensitized cells or shock tissues then determines the symptomatology of an allergic reaction."² If it is located in the nose, we will have manifestations of which hayfever is an example; if in the lungs, asthma; in the skin, eczema or urticaria, etc. Thus when we have symptoms referable to the nose, and of these symptoms nasal obstruction

*Read at the annual meeting of the Northern Minnesota Medical Association, Detroit Lakes, Minnesota, September 8, 1939.

is paramount, it is very important to determine with every means at our command whether the basis of the findings is due: (1) to the presence of shock tissue with its attendant reaction which we call allergic; (2) to an infectious agent; (3) to anatomical abnormalities; (4) to glandular or vitamin disturbances; or (5) to normal physiologic response to varying environmental changes.

It is important to emphasize some physiological facts concerning the nose as they relate to this symptom of nasal obstruction. Patients coming to you complaining of this symptom do not necessarily have pathological processes causing them. To many, the nose may or may not be a thing of beauty, but to all a well functioning nose is a blessing. It must have a perfectly adaptable mechanism, when you realize that it is the only organ of the body that cannot be adequately protected from the environmental surroundings in which it performs its functions. These are four-fold: to filter, to moisten, and to warm the inspired air, and lastly to smell. The efficient performance of these processes depends chiefly on the function of the vasomotor mechanism. What are some of the physiological responses of the nose which may be interpreted by the laity, and also by many doctors, as nasal obstruction? These are described fully by Lillie in a recent article.⁶ Briefly, allow me to indicate a few. We all know that the nasal cavity is divided by the septum, but we forget that it is scarcely ever straight. The importance then of a deviated septum lies in its effect on the nasal function. This was brought sharply to my attention quite early in my practice when, with the assuredness that comes only with recent completion of one's medical education, I would, after inspection of a nose with a bad deflection, state, "You must have considerable difficulty in breathing through your nose?" In the majority of cases the answer would be, "Not at all." Confidently, I would inspect another nose which, intranasally looked fairly normal, and then I would venture the statement, "Surely you have no trouble with your nose?" The answer would come back, "Doctor, I have a lot of trouble breathing. The nose is blocked most of the time." I soon learned to make my examinations with no comment, but would wait for a voluntary declaration from the patient. The point is, I was looking at the nose from an anatomical

standpoint, and not from a physiological one. Increased knowledge of the physiology of the nose in the last quarter of a century has now placed rhinology upon a more scientific basis. Many failures of intranasal operations can be traced to the fact that they were performed upon a strictly anatomic basis with no consequent relief of the patient's symptoms.

Another interesting point brought out by Lillie was the relationship of the erectile tissue of the nose and the sexual development of an individual.⁶ "It becomes clinically important that this be recognized, for it accounts for many of the so-called stuffy noses so often seen in adolescence and newly married couples." He also calls your attention to the effect of the climate and other atmospheric changes. "In the variable, rugged climate of the Northwest with frequent changes in the weather, one might expect that the membrane of the upper part of the respiratory tract would become hypertrophic, whereas, in the warm, equable climate, where the nose is not required to function excessively, there might be very little change." You are all familiar with the patient who complains at night of obstruction on the side on which he is lying. As Lillie states,⁶ this is due to passive congestion from gravity and is a normal condition. One must be sure, however, before one dismisses the patient, that this physiological evaluation of one's findings is not aggravated by some pathological process. Thus in one's final conclusion as regards normal physiological properties of the nose, let it not be said of you, "Some to the fascination of a name, Surrender judgment hoodwink'd."¹¹

Confronted with a case of nasal obstruction, we apply our reasoning so as to either convict the case as one of allergy, or by our findings find it non-allergic in origin. Proceeding in this manner, we have personally found that fewer mistakes are made in diagnoses. In some minor cases, the diagnosis is self-evident and detailed procedures are not necessary. However, you who feel that you have very few cases of allergy in your practice have overlooked them by not proceeding along an orderly manner in examination and diagnosis. In our limited experience, we can conservatively state that 30 per cent of our nasal cases seen in routine private practice have local findings attributable to allergy, or are associated with other manifestations of it. There-

fore to institute therapy on a rational basis, one should complete the clinical history, the physical examination, and laboratory procedures. As Faulkner³ states, it may seem advisable to take a preliminary history, then make an examination of the nose, and if there is found a suspicion of allergy, a more complete history can be taken. In any event, the clinical history must be thorough and complete. This cannot be stressed too strongly, for in many atypical cases a positive family history aids in the diagnosis, whereas the examination and laboratory procedures may fail us. As Hansel⁴ emphasizes, every possible relationship of the symptoms to the etiologic factors and to the possible association of other manifestations of allergy must be considered. Thus, first, the family history is all-important. He found in about 70 per cent or more of all cases there is a history of the occurrence of various manifestations of allergy in the family. This is the one true and common foundation all allergists stand upon: namely, the hereditary factor. Secondly, the association of other manifestations of allergy in the past and present must be analyzed. Hansel⁴ found this association in approximately 70 to 75 per cent of all cases of nasal allergy. Thirdly, the nasal symptoms, and particularly as regards this discussion the symptom of nasal obstruction with its associated manifestations, should be thoroughly considered from the following standpoint:

1. The time of onset should be exactly determined, if possible, so as to better associate the symptoms with possible contacts with the offending substances. The characteristic features of the onset with the effect of occupation, environment, seasons, drugs, foods, acute infections, and the physiological changes accompanying the different stages of life upon it, must also be considered.

2. The course and nature of the symptom of nasal obstruction as to whether it is constant or intermittent must be studied. Thus an analysis of acute exacerbations or periods of relief must be taken into account.

3. The relation of the symptom under discussion to the seasons, time of day, home or foreign environment, sports, occupation, foods, climate, physical agents, previous nose and throat treatments, either surgical or medical, and the effect of other diseases or illnesses must be

taken into consideration. This indicates briefly the type of clinical history that should be taken.

As the main characteristic reaction of allergy is edema, we should naturally expect to find on physical examination varying stages of that state in the typical cases. This can vary from the simplest sign of edema, indicated by pallor and intumescence of the mucosa, to marked hypertrophic thickening and polyposis. These changes can also occur in infections. Therefore aside from obstructions, physiologically or anatomically produced, the differentiation in most cases must be made between allergy and infection. Hansel⁴ states that with the exception of acute infections, allergy is the most common affection of the nose and paranasal sinuses. In typical cases, the symptoms and findings are so classical that the diagnosis is perfectly evident. In atypical cases, however, the symptoms may be intermittent, simulating recurring attacks of acute rhinitis. Therefore, other aids in diagnosis must be called upon. One of these is cytology of the nasal secretions. This procedure has been promoted so strongly of late that it has led many to disparage its importance, and has led them to remark that the diagnosis of allergy is dependent chiefly upon the findings of cytology. The true diagnostician regards the findings of cytology in the same light that the surgeon views an increased leukocytic response in the presence of an acute belly. In other words, it indicates that something is going on, and spurs investigation. We believe that there would be fewer mistakes made in diagnosis if the cytologic findings were taken at their face value rather than scoffed at or disregarded. Hansel⁴ is one of many authorities who consider it highly diagnostic. He states that wherever the lesion of allergy occurs, it is characterized by edema and eosinophilic infiltration. The eosinophiles are found in the secretions upon microscopic examination, even when there may be no visible evidence of edema. The presence of eosinophiles in significant numbers is absolute evidence of the allergic process, he states. A persistent absence of eosinophiles, except in cases of marked complicating supuration, definitely excludes the possibility of allergy. During acute infections, the secretions may contain only neutrophils and a few or no eosinophiles. As the infection subsides, the neutrophils gradually disappear and the eosinophiles gradually reappear in increasing numbers,

the secretions finally becoming clear and watery or mucoid. With marked nasal obstruction, secondary infection of the stagnation type may occur in which the secretions show a considerable number of neutrophils as well as eosinophiles. Upon restoration of nasal respiration, the neutrophils quickly disappear. By repeated cytologic observations over a prolonged period of time, it is possible to determine the exact incidence of infections in the allergic individual, and also to indicate whether true allergy is present. In other words, one microscopic examination is not sufficient, but many should be performed. Nasal obstruction is rarely an emergency matter, so careful observation and examination should be the rule.

Having completed the history and physical examination with the laboratory procedures thus far indicated, the skin tests should next be performed. Again allow me to emphasize that too much importance has been placed upon them by the members on the outer fringe. They have exaggerated the importance of them and have said, just as they did in the case of the cytologic procedure, that the diagnosis of allergy is based on the skin test findings. Now these skin tests are not infallible. Many positive reactions can occur with no clinical proof, and in addition there may be many clinical manifestations of allergy with negative skin tests. However, the information obtained should always be correlated with the clinical history, the physical findings, and the other laboratory procedures. "In the final analysis of the relationship of positive skin reactions to the clinical sensitiveness, it should be determined whether the patient has contact with the suspected substances and whether upon contact the symptoms are produced."⁵

As further aids in diagnosis, we can but mention, due to the limitation of time, the bac-

teriologic and radiographic procedures, the elimination diets, and the effect of the allergenic treatment upon the given condition.

It has not been the purpose of this paper to present the diagnosis and treatment of allergic nasal obstruction, but its scope has been centered on the thought that every nasal obstruction should be considered allergic until proved otherwise. The methods of procedure to determine this have been indicated.

Conclusions

1. Every case of nasal obstruction, either acute or chronic, should be considered allergic in origin until proven otherwise.
2. The known physiological facts concerning nasal function should be remembered in every case of nasal obstruction.
3. With the exception of acute infections, allergy is the most common affection of the nose and paranasal sinuses. This is important to remember in treating nasal obstruction in children. It explains many poor results obtained from tonsillectomy and adenoidectomy.
4. In investigating a case of nasal obstruction, the history, and physical examination with laboratory aids are just as important in making the diagnosis as the skin tests, the bacteriologic and radiographic examinations.
5. Eosinophilia is indicative of allergy, but not absolute proof of its presence.

Bibliography

1. Cowper, William: The task, Book VI, Line 96. Poem.
2. Ellis, Ralph: Notes from Postgraduate Course, University of Minnesota, July, 1938.
3. Faulkner, E. Ross: Problems in diagnosis and treatment of hyperplastic sinusitis and allergy. *Ann. Otol., Rhinol. and Laryngol.*, 47:144-152, (March) 1938.
4. Hansel, French K.: Diagnosis and treatment of allergy. *Ann. Otol., Rhinol. and Laryngol.*, 48:359-374, (June) 1939.
5. Hansel, French K.: Allergy of the Nose and Paranasal Sinuses. St. Louis: C. V. Mosby Company, 1936.
6. Lillie, H. I.: Practical physiology of the nose. *Minn. Med.*, (September) 1938.

ABORTIFACIENT BARRED

On Jan. 21, 1939, Olaf M. Bornstad of Minneapolis was called on by the Post Office Department to show cause why the mails should not be closed to the "Bornocks Company," a trade style used by Bornstad in advertising and selling through the mails "Bornock's Tablet Treatment" as a means of producing abortion. Bornstad solicited business "by the use of newspaper advertisements" and letters. Mr. Bornstad waived a

hearing and indicated a willingness to have all mail addressed to his company returned to senders. On Feb. 15, 1939, the mails were closed to the Bornock's Company, and its officers and agents as such, because the business was a violation of statutes prohibiting the advertising and sale through the mails of any matter to be used for the purpose of producing abortion. (J.A. M.A., Oct. 21, 1939, p. 1583.)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

(Continued from January issue)

Hahnemann Medical Society of Hennepin County

Tribune Directory, 1873-1874:

"The Homeopathic Society was organized a few months ago under the name of Hahnemann Medical Society of Hennepin County. The officers are: W. H. Leonard, President; T. R. Huntington, Secretary and Treasurer. Meetings the first Friday of every month in the office of Drs. Goodwin and Flanders."

The following note of the Homeopathic Society is from *Neill's History of Hennepin County*:

"The Hahnemann Medical Society of Hennepin County was organized September 16, 1872, and was the result of an informal meeting of the Homeopathic physicians of the city held in Dr. W. H. Leonard's office September second of that year. A constitution and by-laws were adopted and signed by Drs. D. M. Goodwin, W. H. Leonard, G. F. Flanders, T. S. Huntington, M. H. Wallens, and Petrus Nelson. Dr. Huntington died in March, 1873. * * * * In May, 1880, a plan for a free dispensary was begun which resulted in the Cottage Hospital."

The latter statement would seem to have been an error, since the Cottage Hospital was opened early in March, 1871, and was due largely to the efforts and energy of Bishop Knickerbocker of the Brotherhood of Gethsemane, aided by Dr. Ames.

Davison's Directory, 1874: President, W. H. Leonard; Vice-president, G. F. Flanders; Secretary and Treasurer, P. Nelson.

Campbell's Directory, 1875: President, P. L. Hatch; Treasurer and Secretary, G. F. Flanders; Censors, Goodwin and Leonard.

Campbell's and Davison's Directory, 1876: President, D. M. Goodwin; Treasurer and Secretary, P. Nelson; Censors, Goodwin and Leonard.

Campbell's and Davison's Directory, 1877-1878: Officers same as before.

1878-1879: Officers same as before.

1879-1880: President, W. H. Leonard; Secretary and Treasurer, Miss Hutchinson.

Davison's Directory, 1880-1881: President, A. A. Camp; Treasurer and Secretary, S. P. Sterrett.

Davison's Directory, 1881-1882: President, A. A. Camp; Vice-president, Mary L. Swain; Secretary and Treasurer, Adele S. Hutchinson.

1882-1883: Officers same as before.

With this year the lists cease in the directories until 1893, when I have a record of the Hennepin County Medical Society, but nothing further of the Homeopathic Society.

HISTORY OF MEDICINE IN MINNESOTA

Minneapolis Hospitals

As the COTTAGE HOSPITAL was the first private hospital to be opened in the Falls Cities, a further word as to its organization and development may not be out of place. The following items are taken largely from the *Daily Tribune*:

Daily Tribune of January 22, 1871:

"Through the kindness of Dr. A. E. Ames, the physician of the Brotherhood of Gethsemane, a dispensary has been opened in Dayton's Block by the Brotherhood for supplying the deserving poor with medicine and advice gratis. We hope this is preparatory to the opening of a hospital, an institution much needed in our city."

On Friday, March 3, 1871, the *Tribune* printed an editorial on "The New City Hospital," emphasizing its need, and giving something of its history:

"To come back to Minneapolis, the Brotherhood of Gethsemane, a benevolent institution believing that the time has come when in a population like that of the two Falls cities some provision should be made for the sick and maimed destitute, have taken the first decisive steps to that end by assuming the responsibility for providing a building for the purpose and, reckoning thereafter upon the benevolent promptings of our citizens to sustain the undertaking, they ask for money and a good attendance at Dr. Ames' lecture."

Then follows "The Appeal of the Brotherhood of Gethsemane in behalf of the Cottage Hospital." They had already secured a matron and received \$500 to furnish the building, rented temporarily on Washington Avenue beyond Bassett's Creek. Donations were to be sent to Messrs. Mendenhall and Westfall.

On March 7, the *Tribune* printed a letter from Rev. Knickerbocker in reference to the hospital, extending thanks, and adding:

"And now permit me to say a few words about the future of such a hospital. An institution like this in a large and prosperous community like Minneapolis and Saint Anthony should not be permitted to remain long in a rented and uncomfortable building. The time is not far distant when a medical faculty and a medical school must be connected with the rising University of Minnesota. A hospital is indispensable for such a school. Why shall this not grow into something of the kind? * * * * *

On March 9, a letter from A. E. Ames appears saying that there will be no contagious diseases admitted to the hospital, as the city itself already has a pest-house outside the city limits.

The Sunday, March 19, edition of the *Tribune* gives the following items under the heading,

"The New Hospital"

"The work of furnishing and preparing the hospital has been so far perfected as to admit of the reception of patients. Our citizens have responded generously to the call for aid in the enterprise. Already many useful donations of furniture and provisions have been made. Some eight beds have been provided, besides a good part of the general furniture of the house. The Masonic order has furnished a room comfortably. The employees of the Milwaukee car and machine shops a room. The Nicollet House, St. Mark's Parish, the Ladies' Aid of Gethsemane Church, the Brotherhood of Gethsemane, a lady of the Brotherhood of Gethsemane, and the millers each contributed the means to furnish a bed. The druggists have furnished a generous supply of medicine, the liquor merchants the necessary liquors, whilst several individuals have given general pledges of assistance. These will all be acknowledged in detail later. The bedding is all new and made up by the Ladies' Aid Society of Gethsemane Church. The first patient was received into the hospital on Tuesday [March 14], an orphan lad, eighteen years of age, without friends, of German parentage. He had been a newsboy on the Pacific Railroad and had been taken sick in a boarding house

without means of support. He expressed great gratitude for the comforts and attention of the home. A second patient was received on Thursday [March 16]. He was a Swede who lost a leg recently on the Milwaukee Railroad and was brought from Mendota. He, too, was overjoyed to get where he could receive proper care and attention. The third patient was received on Friday, a Norwegian, taken down in a bawdy house with pneumonia. He was brought to the hospital in filth and rags and was cleaned and made comfortable.

"Thus is the hospital meeting a great want in the community. It will no doubt soon be filled. It has a capacity of four more beds, which should be furnished at once. The working men of Minneapolis will take an interest in this home and contribute liberally to its support. It is the small contributions of the many that are asked to sustain it. . . .

"The government of the hospital is entrusted to the following persons: Superintendent, Rev. D. B. Knickerbocker; matron, Mrs. Mary A. Everts; physician and surgeon, Dr. A. E. Ames, with Drs. Goodwin and Linn as consulting physicians and Drs. Hutchinson and Hill as consulting surgeons; Treasurer, W. H. Chamberlain; Secretary, S. B. Cowdery; Directors, W. H. Greene, H. P. Westfall and R. J. Mendenhall. . . .

"Private patients can be accommodated and can have their own physicians visit them when they wish, as may also any beneficiaries."

The *Tribune* of April 2 contains an editorial urging a larger building, and on April 6 is found a notice of the first death in the hospital. The report of the hospital for May was as follows: Seven males and one female admitted. Four discharged, and one died. A note was made that during Dr. Ames' absence in California, attending a medical society, Dr. Linn had discharged the duties of medical attendant to the hospital.

The *Tribune Directory* of 1874-1875 gives the medical officers of the Cottage Hospital as follows: Drs. E. Phillips, A. Ortman, W. H. Leonard, and C. W. Putnam, attending and visiting physicians.

In 1876 (Campbell and Davison's *Directory*) the medical staff consisted of Drs. Phillips, Ortman, Leonard and Putnam, and in 1877, Dr. A. A. Camp was added. The staff remained the same in 1878 and 1879, but, in 1880, was changed to the following: Drs. Dunsmoor, Spaulding, Leonard, Putnam, and Camp. The 1881 staff comprised Drs. Dunsmoor, Wells, Abbott, Hamilton, Lawrence, Leonard and Camp.

BETHANY HOME was founded by the Sisterhood of St. Bethany in 1875, "for helping the tempted, saving the fallen, and restoring erring women to the right life." Mrs. T. B. Walker, who was secretary and later president of the Sisterhood, related in a report given to the organization just before her death in 1916, how a few women had become "somewhat disturbed by what they considered an unjust judgment of the court in sending four women to the State Penitentiary for immoral lives without making any effort to bring their male associates to judgment for the same offences. An appeal to the Governor brought the answer that if the sentence was remitted there would be no place for these women to go except back into their former lives. A house was rented, a matron provided and the four women received. But they soon rebelled against their position and, with their Bibles under their arms, walked out of this strange new home and pawning their Bibles for whiskey, were gloriously drunk and in the hands of the police before the morning of their first night of liberty."

For several years unmarried mothers were not admitted, for the founders felt that the public woman and the misled girl could not be associated together without injury to both. But in the course of the years the policy of the board changed and a maternity hospital developed and grew into the present Harriet Walker Hospital, named for the founder who served on its board for forty-one years and was also the first president of the Northwestern Hospital Board.

The MINNEAPOLIS FREE DISPENSARY was founded in 1878 by Hon. C. A.

HISTORY OF MEDICINE IN MINNESOTA

Pillsbury, Geo. A. Brackett, C. M. Loring, A. B. Barton and E. S. Jones. It was intended to meet the necessities of a large class of deserving poor, who, while in need of medical assistance, were yet not subjects for hospital care. It was located at 208 Second Street South, where it remained until 1882, when it was incorporated into and became a department of the Minnesota College Hospital just established on the East Side in the building formerly known as the Winslow House.

Until 1881 the Cottage Hospital, whose name was changed to St. Barnabas in 1884, would seem to have been the only general hospital in Minneapolis, but in that and the following year there was a regular epidemic of hospitals, that of Dr. A. A. Ames being the second in the city. The directory of 1882-1883 contains this list of such institutions:

"Ames, A. A., Private Hospital, 4th Ave. So. and Washington.

"Cottage of the Brotherhood of Gethsemane, Cor. 9th Ave. So. and 6th St.

"Minn. College—Dr. L. C. Mitchell, Superintendent.

"Sisters of Mercy, 6th St. Cor. 25th Ave. So.

"Homeopathic—A. L. Bausman, Secretary."

The MINNESOTA COLLEGE HOSPITAL was established in 1881 in the large stone building well known at the time as Macalester College, formerly the Winslow House, on the corner of Bank and Second Streets, Southeast. In 1883 it was said to have a capacity of three hundred beds and was in charge of an able corps of physicians and nurses under the general direction of the board of trustees.

A HOMEOPATHIC HOSPITAL had recently been organized in 1883, when Richard Olding Beard compiled a Handbook of Minneapolis. Some fifty patients could be accommodated at their temporary quarters at the corner of Ninth Street and Eighth Avenue South. Its Hahnemann ward of ten beds was supported by the ladies of the city and in charge of female physicians. "The main hospital is under the care of competent homeopathic physicians."

According to Dr. Beard's Handbook of 1883, the SISTERS' HOSPITAL at 2416 Sixth Street South, under the management of the Sisters of Mercy, had a medical staff appointed by the sisters and provided care for seventy-five patients.

The NORTHWESTERN HOSPITAL was opened November 20, 1882, in a small rented house on Fourth Avenue South and Twenty-fifth Street. The organization meeting was held at the Friends Meeting House and Mrs. T. B. Walker was made president. Within a year the hospital was moved to a large house on Clinton Avenue, purchased for about \$3,000, and in 1887 a new building was completed at Chicago Avenue and Twenty-seventh Street, on land donated by Hon. L. M. Stewart, and still occupied by the present hospital buildings.

The institution was established in 1882, for the treatment of women and children, with a staff composed wholly of women: Drs. Mary G. Hood, Mary S. Whetstone, with Dr. Emily Fifield as resident physician. The consulting staff consisted of Drs. A. W. Abbott, H. H. Kimball, S. S. Whetstone, S. F. Hance, C. L. Wells, and A. H. Lindley.

The signers of the articles of incorporation included Drs. Annie T. Hass, Lizzie R. Hass, Mary G. Hood, and Mary S. Whetstone, along with a group of nine women headed by Mrs. Harriet G. Walker.

MATER MISERICORDIA HOSPITAL. In 1882, Mother Joseph, a Sister of Mercy from New Orleans, who was conducting a school in Anoka, purchased a tract of land on the west bank of the Mississippi, known as Murphy's Grove, a favorite picnic ground for the residents of the nearby towns of Saint Anthony and Minneapolis. The large frame house, home of the Murphy family, was taken over

HISTORY OF MEDICINE IN MINNESOTA

by Mother Joseph and her companion, Sister Antonia, and opened as the first Catholic hospital in Minneapolis, the Mater Misericordia Hospital. The project was abandoned after a few years and the property bought by Bishop Ireland who turned it over to the Sisters of St. Joseph, who later opened St. Mary's Hospital there.

MATERNITY HOSPITAL was established in 1886 by Dr. Martha G. Ripley when she cared for three indigent maternity cases in a home on Fifteenth Street South. During the first year of its existence, thirty-seven women and thirty-two children were admitted.

The CITY HOSPITAL was organized by a resolution of the City Council passed July 1, 1887. In 1920, the name was changed to Minneapolis General Hospital. The following doctors have served as superintendents since its was established:

Dr. J. H. Dunn.....	July 1, 1887—July 1, 1888
Dr. Chas. A. Chase	July 1, 1888—Feb. 20, 1893
Dr. Chas. G. Weston	Feb. 20, 1893—July 1, 1899
Dr. Wm. J. Byrnes.....	July 1, 1899—July 1, 1901
Dr. Henry S. Nelson	July 1, 1901—July 1, 1903
Dr. George E. Ricker.....	July 1, 1903—July 1, 1905
Dr. Emil H. Beckman.....	July 1, 1905—July 1, 1907
Dr. Ole Linjar	July 1, 1907—Dec. 11, 1907
Dr. Peter M. Holl.....	Dec. 11, 1907—May 17, 1909
Dr. Arch E. Wilcox.....	May 17, 1909—July 20, 1909
Dr. Herbert O. Collins.....	July 20, 1909—July 16, 1918
Dr. Harry A. Britton.....	July 16, 1918—Dec. 15, 1919
Dr. J. M. Neal.....	Dec. 15, 1919—Jan. 20, 1920
Dr. Walter E. List.....	Jan. 20, 1920—Oct. 1, 1930
Dr. Chas. E. Remy.....	Oct. 1, 1930—July 31, 1937
Dr. F. E. Harrington, Acting Superintendent.....	July 31, 1937—Dec. 31, 1938
Dr. D. W. Pollard, Acting Superintendent.....	Jan. 1, 1939—to date

ST. MARY'S HOSPITAL was founded in 1887 by the Sisters of St. Joseph of Corondelet. Sister St. John Ireland, Superior of Holy Angels Academy, Minneapolis, was sent out to investigate the property vacated by the Sisters of Mercy after their brief tenure as the Misericordia Hospital, and found the old Murphy house entirely empty except for two straw bonnets such as were worn by the Sisters from New Orleans. Shortly, linen and supplies for the new mission were gathered at the Holy Angels Academy and in October, 1887, St. Mary's Hospital began its work in the old frame house. It could house twenty patients who had to be carried up and down the stairs. The attic was a ward; operations were performed on the table in the Sisters' dining room; water and instruments were sterilized in the kitchen; the Sisters ate from the pantry shelves and went without service of kitchen stove on operating days.

In 1890, the cornerstone was laid for a new four-story brick building, increasing the capacity to about one hundred. The school of nursing was formally opened in 1900.

The following physicians were the first in attendance at St. Mary's Hospital: A. W. Abbott, J. W. Bell, J. P. Barber, C. M. Cannon, J. H. Dunn, F. A. Dunsmoor, G. G. Eitel, Wm. A. Hall, P. M. Hall, R. J. Hill, W. A. Jones, J. W. Little, A. C. McCollom, J. E. Moore, L. A. Nippert, W. E. Rochford, C. J. Spratt, W. A. Spring, H. B. Sweetser.

Dr. J. H. Dunn was the first chief of staff, and his successors have been Drs. H. B. Sweetser (fifteen years), A. S. Hamilton, J. F. Corbett, J. M. Hayes, Leo Murphy, J. E. Hynes, M. J. Lynch, and Willard White.

HISTORY OF MEDICINE IN MINNESOTA

The LUTHERAN DEACONESS HOME and HOSPITAL (1412 East 24th Street) began November 1, 1888, with a twelve-bed capacity in a small house at Hennepin Avenue and 27th Street with two years free of any rental charge. It was incorporated August 17, 1889, with Rev. M. F. Gjertsen, Prof. G. Sverdrup, Prof. S. Oftedal, and Frederick Laws, M.D., as the first board of trustees.

In 1891, a house and two lots on 23rd Street and Fifteenth Avenue South were purchased for \$5,500. The house was remodeled at a cost of \$3,500 to accommodate twenty-eight patients. At the time of the typhoid fever epidemic in 1892, a smaller building, consisting of two nine-bed wards, was erected at a cost of \$1,800 for the exclusive care of typhoid patients. In 1897, an adjoining lot with house was purchased for \$1,800 and in 1900 another house and lot added at a cost of \$1,600. These buildings provided hospital beds and homes for the deaconesses until the present modern hospital was erected in 1910.

Drs. Frederick Laws, Knut Hoegh, Jakob Hvoslief, and P. A. Aurness were the first attending physicians. In 1900, the medical staff was organized, with Dr. Frederick Laws as Chief of Staff, whose members were Drs. Frederick Laws, Henry Cotton and P. M. Holl; the surgical staff, Drs. Jacob Hvoslief, P. A. Aurness, George Haggard, and C. G. Weston; and the consulting staff of Drs. A. W. Abbott, and J. E. Moore. Drs. K. O. Bendeke and W. A. Jones were specialists in eye, ear, nose and throat, and nervous and mental diseases, respectively.

ASBURY HOSPITAL was opened September 1, 1892, under the auspices of the deaconess organization of the Methodist church and through the efforts of Mrs. Sarah Harrison Knight, who continued as its superintendent until her death in 1928. Mrs. Knight founded the Rebecca M. Harrison Deaconess home in 1891 after the Northwestern Deaconess Home, of whose board of control she was a member, had been abandoned. The care of the sick charges of her deaconesses and the training of deaconess nurses necessitated a hospital organization. She purchased the entire capital stock of the Minnesota College Hospital, which included a building at the corner of Ninth Avenue and Sixth Street South, which had been used as a dispensary by the University of Minnesota, and opened a hospital of thirty-four beds. In the first two and a half years they had cared for 1,065 patients in the hospital and 5,226 in the free dispensary.

In February, 1895, a fire partially destroyed the hospital. The patients were removed without harm and housed in St. Barnabas Hospital until the damage of the fire was repaired and patients again received less than three months later. The subsequent chapters of new buildings at the corner of Elliot Avenue and Ninth Street South, of the lease to the Veterans' Bureau and of the present building at 916 East 15th Street, took place after the turn of the century and so do not belong in the present volume.

Among the doctors whose names appear in the early records are found: Dr. F. R. Woodard, who is said to have brought the first patient to the hospital, Drs. F. A. Dunsmoor, G. G. Eitel, J. Warren Little, H. M. Bracken, W. A. Jones, George Douglas Head, Louis A. Nippert, J. C. Litzenberg, Arthur Gillette, Wm. R. Murray, and Frank C. Todd.

(To be continued in March issue)

CASE REPORT

SULFAPYRIDINE IN THE TREATMENT OF STAPHYLOCOCCUS SEPTICEMIA

J. S. BLUMENTHAL, M.D.

Minneapolis, Minnesota

A REPORT of recovery in a disease as almost invariably fatal as staphylococcus septicemia is always of interest. The introduction of sulfanilamide and more recently sulfapyridine in infections of all kinds has resulted in recent reports of recovery in several cases of this type. Morris⁸ reports a case with four positive cultures of staphylococcus albus treated with antitoxin, transfusions and sulfanilamide; Thornhill, Swart, and Reel⁷ report two cases of staphylococcus aureus septicemia which recovered following use of sulfanilamide, transfusion and drainage of localized abscesses. Fenton and Hodgkins¹ used sulfapyridine in staphylococcus aureus septicemia with an atypical clinical picture with good results. O'Brien and McCarthy⁹ report using sulfapyridine in a staphylococcus bacteremia following furunculosis with recovery, as does Maxwell⁴ in the same type of infection in a case of pneumonia. Goldberg and Sachs² used sulfapyridine with recovery in two cases of staphylococcus bacteremia. Long³ reports sterilization of the blood in three out of five patients with staphylococcus bacteremia.

The case now reported is that of a man, aged fifty-four, admitted to St. Andrews Hospital, April 2, 1939, with a history of having fever and headache of several hours' duration. He had had an upper respiratory infection for several days but with no serious symptoms and apparently no fever or cough. He had no other complaints on admission. His past history was negative except for a history of lues of ten years duration adequately treated. He had had an osteomyelitis of his right big toe, which had been amputated eight years ago with no complications thereafter. He is married and has a wife and four children living and well. He had noticed some incontinence the last year. Otherwise the past history was essentially negative.

Examination revealed a very sick patient who had no subjective symptoms and now said he felt fine. His temperature was 105° F. The only positive findings were failure of pupils to react to light and absent knee jerks. The prostate was apparently normal but there was a residual of 600 c.c. of urine. His hemoglobin was 56, r.b.c. 3,200,000, w.b.c. 10,350. Blood smears showed a shift to the left in polymorphonuclears with a differential of 92 per cent neutrophils, 7 monocytes, 1 eosinophile. His blood Wassermann was negative and Kline 2 plus. The urine showed albumin positive with 250 to 350 pus cells, 2 to 4 r.b.c. per field. Blood urea nitrogen was 14.1 mg. per 100 c.c. of

blood. Spinal puncture was entirely negative. Urine culture on April 6, 1939, showed a positive staphylococcus albus culture and blood cultures on April 13 and April 14 showed the same organisms. On the basis of these findings, the diagnoses were cord bladder, cystitis with staphylococcus albus septicemia.

An indwelling catheter was inserted and the bladder irrigated with potassium permanganate. Sulfanilamide in 6 gram daily doses was given but with no improvement and after six days sulfapyridine in 5 gram daily doses was substituted. On this therapy the temperature began to drop and the patient looked improved. His urine cleared up until on April 18, 1939, there were only 2 pus cells per field.

Transfusions of blood, 2,500 c.c. in all, were given on April 14, 17, 25, May 2, and 8. His leukocyte count had gradually dropped until it was 6,000 on May 4 but the sulfapyridine had been continued due to a still slightly septic temperature. On May 10, the patient was sent home in fairly good condition but with catheter still indwelling as he had difficulty in voiding. When it was removed, after a few weeks at home, the patient voided with no difficulty. The sulfapyridine was given for three weeks in gradually decreasing doses.

Comment.—A case is reported of staphylococcus albus bacteremia with cord bladder treated by sulfapyridine with recovery. It is, of course, questionable how much credit, in this case, should be given to the transfusions, which were primarily used to increase the red blood count and hemoglobin, and how much to the drug; but certain it is that since the use of sulfapyridine more cases of recovery in staphylococcus septicemia have been reported and in this patient definite improvement was manifest after its use and also after failure to improve on sulfanilamide.

Bibliography

1. Fenton, W. J., and Hodgkins, Fred: *Lancet* 2:667, (Sept. 17) 1938.
2. Goldberg, Samuel L., and Sachs, Allen: Sulfapyridine in the treatment of staphylococcus bacteremia. *Jour. A.M.A.*, 113: 1639, (Oct. 28) 1939.
3. Long, P. H.: Sulfapyridine. *Jour. A.M.A.*, 112:538, (Feb. 11, 1939).
4. Maxwell, James: *Lancet*, 2:1233, (Nov. 26) 1938.
5. Morris, John F.: Staphylococcus septicemia. *West Va. Med. Jour.*, 35:186, (April) 1939.
6. O'Brien, E. J., and McCarthy, C. J.: *Lancet*, 2:1233, (Dec. 3) 1938.
7. Thornhill, William A., Swart, Howard A., and Reel, Clifton: Sulfanilamide in staphylococcus septicemia. *Jour. A.M.A.*, 113:1638, (Oct. 28) 1939.

President's Letter

ON February 24, the Annual Officers' Conference will be held in Saint Paul. Excepting the annual meeting of the State Medical Association this is the most important medical meeting held in our state; and in some respects this annual conference of county society officers stands out above the State Medical Association meeting. It is particularly important that the secretaries of the county and district medical societies attend, for they are the spark plugs that energize the societies. The president and other officers, the committee members and especially the committee chairmen each have an important part to play; but an active, tactful secretary can do more to keep a society active and useful than anyone else.

Reports will be given at this meeting on what is going on in other societies—county, state, and national. The relief situation in its innumerable ramifications will be discussed; the latest information as to what Washington proposes to do will be available. Although but little information has been given out as yet regarding a new Wagner Bill, we are told there is one in the offing.

Economic changes are in the forefront today, and it is no time for any physician, much less any society, to be indifferent. That the doctors in our country are realizing the dangers inherent in impending changes in our economic status is shown by the greatest increase in the A.M.A. membership in decades and also by the very generous support being given the new National Physicians' Committee for the Extension of Medical Service. These are heartening signs, but our efforts must continue, and we may be called upon for more strenuous work than ever.

BERTRAM S. ADAMS, M.D., President
Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL
ASSOCIATION

Published by the Association under the direction of its Editing
and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

PHILIP F. DONOHUE, Saint Paul	THOMAS G. CLEMENT, Duluth
E. M. HAMMES, Saint Paul	O. W. ROWE, Duluth
H. W. MEYERDING, Rochester	T. A. PEPPARD, Minneapolis
WALTMAN WALTERS, Rochester	C. B. WRIGHT, Minneapolis
C. L. OPPEGAARD, Crookston	
B. O. MORK, JR., Worthington	

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
W. F. BRAASCH, Rochester, Associate Editor
GILBERT COTTAM, Minneapolis, Associate Editor

Annual Subscription—\$3.00

Single Copies—\$0.40

Foreign Subscriptions—\$3.50

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, \$1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or Suite 308, National Bldg., Minneapolis. Telephone: Nestor 2641.

BUSINESS MANAGER

J. R. BRUCE

Volume 23

FEBRUARY, 1940

Number 2

SULFAPYRIDINE AND PNEUMONIA

THE numerous reports on the use of sulfapyridine in pneumococcal pneumonia have served to standardize to considerable extent the use of this new drug. While the drug is not without its drawbacks and the possibility of toxic manifestations of serious import must be ever kept in mind, the numerous reports of series of lobar pneumonia with mortality rates of less than 10 per cent from the use of sulfapyridine alone or in conjunction with serum indicate a great advance in the treatment of this disease.

The accepted treatment is now to begin the administration of sulfapyridine as soon as a diagnosis of lobar pneumonia is made. The same holds true of postoperative pneumonia, and even in bronchopneumonia, which may be due to the pneumococcus. Every effort should be made to determine the type of pneumococcus. Upon determination of the type there is good reason to administer serum, although in many cases the improvement by the time the type is determined may justify its omission. Smaller dosage of serum seems to be effective when given in conjunction with sulfapyridine.

The purpose in sulfapyridine therapy is to obtain the maximum effect on the pneumococcus in the shortest possible time and to maintain its inhibitory effect on the pneumococcus until the infection is overcome. The initial dosage should be large, 60 grains, or the first two doses 30 grains each at an interval of four hours, and then 15 grains every four hours, day and night. It is well to give the drug following nourishment to minimize the likelihood of nausea and vomiting, although these symptoms are due to an effect on the central nervous system rather than on the stomach direct. If a dose is vomited within an hour after taking, the dose should be repeated. Vomiting is a main drawback in the use of the drug, but ordinarily does not contra-indicate continuance of its use.

One may expect a marked drop in temperature and pulse in twelve to forty-eight hours. If there is no such response within two days, continuation of the drug is probably useless and the etiologic bacterium is probably not the pneumococcus, although some strains of this organism are probably more resistive to the drug than others and absorption of the drug and blood concentration is quite variable.

Because of the rare occurrence of severe toxic effects from the administration of this drug, daily check should be made of hemoglobin percentage, leukocyte count and kidneys, the presence of blood in the urine indicating kidney damage. Jaundice is sufficient indication for discontinuation of the drug. Cyanosis other than

that due to the disease is apparently no indication for stopping the medication.

Ureteral concretions have been reported following the administration of sulfapyridine, more especially following the use of large amounts, although rarely have they been reported following comparatively small doses. The stones are composed of acetylsulfapyridine, are not radio-opaque and probably mechanically produce the hematuria. They apparently disappear on cessation of the drug and fluid administration in large amounts.

Although lobar pneumonia in children is not as severe a disease as in adults, some of the reports of the use of sulfapyridine in these cases are unbelievable. The recommended dosage for infants under two years is 1.5 grains per pound of body weight the first day, and half this amount succeeding days. For those over two years of age the dosage of 1 grain per pound for the first twenty-four hours, and half the amount each day following, has been accompanied by admirable results. The tablets may be crushed and administered in cereal, apple sauce or fruit juices. There seems to be no advantage in prolonging medication for longer than a day following the crisis.

Attention has been called to the fact that crisis in pneumonia treated with sulfapyridine is not accompanied by the feeling of well-being usually experienced. The appearance of the chart rather than that of the patient is a better indication of the progress of the infection. There is reason to believe that resolution of the consolidated lung begins at an earlier date.

Newspaper publicity to the effect that this new drug is 100 per cent effective is to be deprecated. The drug is showing a marked reduction in mortality from pneumococcal pneumonia, but is doubtless not the last word in chemotherapy for this infection.

VIRUS RESEARCH AND ANIMAL EXPERIMENTATION

WITHIN the present decade an amazing amount of progress has been made in the field of the investigation of filterable virus diseases. That this has been possible is due to the discovery of the fact that only by animal inoculation could the course and effects of virus disease be studied and the facts proved. Until this was

determined to be the case much time and effort were expended in following the culture and staining procedures which are so essential in bacteriologic research but give no help whatever in the solution of virus disease problems. In the study of virus disease the culture tube has been supplanted by the living animal, as Francis so aptly stated in his recent article in MINNESOTA MEDICINE.

Here, then, we see one of the most important advances of recent times in a difficult and baffling field made by the utilization of methods which are unreservedly condemned by those who fanatically oppose all types of animal experimentation. Here is concrete proof of its value, in a large way, but it will not be accepted as conclusive evidence by those who choose to cherish their antagonism. The onward march of scientific medicine has always been beset by ignorance and bigotry but somehow or other it has always managed to keep going. It is not a very comforting matter for reflection that from the very beginning up to the immediate present every discovery of value has been made by not merely unravelling the inherent difficulties of a problem but against determined human opposition.

GILBERT COTTAM.

FARMER TO HIS SON

The Conservation Checks ain't out,
I hear they're on the way,
But guess there won't be much for beer
'Cause there's some bills to pay;
We've got to pay the grocer-man,
His terms are strictly cash,
If he's not paid right on the dot
We'll have to live on hash.

I think we'd better pay the guy
That sold us that there seed,
Or he might up and say, "No, sir!"
Right in our time of need;
I'd like to pay the doctor some,
Perhaps a buck or two
Upon account of long ago
Would keep him smiling through!

But then there is the station man,
Where we get gas and stuff,
He's apt to say, "No more, my man,
I've let you take enough."
And then there is the permanent
Your mother wants so bad . . .
For things like that we must pay cash;
Remember that, my lad!

But "Doc" will speed through snow and cold
To serve us when we call—
The thought that age has yellowed bills
Don't slow him up at all;
The other guys must all be paid,
Accounts kept up to date . . .
So till we get our next year's check
We'll let the doctor wait.

—EVELYN OSLUND.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

MEDICINE AND PUBLIC OPINION

AS ONE reviews the political events of the past year as they affected the medical profession, one is impressed with the fact that our position today has definitely improved. Legislation favoring governmental control of medicine has been defeated, both in Congress and in the individual states. It is evident that intelligent public opinion questions whether medical care would be improved by governmental edict, and that the value of free initiative and independence of the physician is recognized.

Reaction Reassuring

The reaction of the press toward the judicial rebuff given federal prosecution of the American Medical Association in the courts was most assuring. It was a signal victory for organized medicine. Progress in this case since then also has been very satisfactory. The defeat of the Wagner Bill, and, of even greater importance, the recent criticism of the bill with admissions of its shortcomings by top-ranking federal officials, shows clearly that they fear the consequences of radical changes in medical care.

The haphazard methods of preparing legislation in the all-important field of Health are clearly illustrated by the Wagner Health Bill. This was emphasized in public hearings on the bill when representatives of organized medicine showed its many inconsistencies. That portion of public opinion which demanded some change in the distribution of the costs of medical care should be appeased by the serious efforts on the part of numerous state and county medical societies to solve this problem. It is generally admitted that compulsory health insurance is undesirable. Various plans of voluntary insurance are being given thorough trials and it is to be hoped that some feasible plan eventually will be evolved.

Swing to Conservatism

The platform recently announced by the American Medical Association adopts a liberal attitude toward these problems which should quiet accusations of reactionism. Then too, a noticeable swing of public opinion toward conservatism and a desire for financial economy have greatly reduced the chances for large congressional appropriations for health reform.—W. F. B.

SEEING EYE TO EYE WITH LEMKE

It is indeed heartening to find a distinguished layman seeing eye to eye with organized medicine in a mutual opposition to regimentation, standardization, bureaucracy and socialized medicine.

Physicians who chanced upon the February issue of a certain popular magazine were especially pleased, no doubt, to note that Congressman William Lemke of North Dakota is sturdily opposed to all four. At the same time it was a little disturbing to the physicians that Mr. Lemke should profess to find the evils of bureaucracy, regimentation and standardization residing in the voluntary democratic organization of physicians. Particularly when it is the physicians' organization which is generally recognized as one of the most potent agencies in opposition to all three in American life today. It was still more surprising that it should be Mr. Lemke who is thus expressing himself with regard to bureaucracy since Mr. Lemke is generally regarded as an exponent of the political philosophy which finds expression in more and more government bureaus.

Investigation Proposed

In any case, it is on the ground of its regimentation, standardization and bureaucratic domination of medical men that Mr. Lemke proposes a Congressional investigation of the American Medical Association in this article.

Of course, the American Medical Association and its members will not oppose a Congressional investigation; on the contrary they may welcome it as one excellent means of impressing upon the Congress and the American people the accomplishments, aims and ideals of the independent medical profession of the United States.

UNSUITED TO MINNESOTA

The President's plan for hospital building where hospital facilities are lacking will undoubtedly have the support and approval of physicians and hospital authorities, provided the building is limited to communities that stand in actual need.

A preliminary inquiry from Washington concerning needs in Minnesota would indicate, however, that Washington planners are not thinking in terms of Minnesota and its needs.

There are undoubtedly a few isolated communities in Minnesota that need hospitals. Small hospitals of fifteen or twenty beds would amply serve these communities.

Would Not Be Used

Experts have advised the government, however, that it is uneconomical to construct and operate hospitals of less than 50 bed capacity whereas it is clear to Minnesota experts that anything larger than twenty-bed institutions in these Minnesota communities would be wasted. The beds would not be used and could not be maintained.

In the tone of this inquiry as in most other government planning it is obvious that the planners are thinking in terms of the South with its large negro population and that any nation-wide plan adapted primarily to southern needs would be utterly unsuited to the sparsely settled regions of Minnesota.

Federal Support Might Be Sought

It should never be forgotten, either, in making plans for government hospitals, anywhere, that the community must pay for the upkeep. Most communities which are already unable to build a hospital will also find it difficult to support one. In that case the hospital will have to be maintained by the state.

Probably direction in state-maintained hospitals would be put in the hands of State Boards of Health and, in Minnesota, the direction and management would undoubtedly be admirable. Cer-

tainly it would be carried on in close cooperation with the Minnesota State Medical Association. In other states the story might be different and in some, no doubt, state support would be refused, altogether, and the hospitals would become federally built and supported institutions.

It was suggested from Washington that the new hospitals might become health centers and house the local county or community public health units. In Minnesota, again, such an arrangement should be entirely satisfactory. There is always the possibility, however, that the public health unit, itself, rather than the state board of health or the state or county medical society would supervise the hospital. Then trouble might arise.

Details Should Be Discussed

All of the details of support, management and supervision should certainly be thoroughly discussed before any hospital building program is undertaken.

"IN JUDGMENT"

[Monthly editorial prepared by the Medical Advisory Committee]

Today the American people sit in judgment on the good and evil works of the various professions. After spending thousands of dollars to educate a medical man, they attempt to break down his morale and try to dissipate that which is most dear to him—his personal interest in his personal clientele and that patient-doctor relationship with which nothing else can compare.

This interest is a duty and this relationship a privilege which, as one grows older in the practice of medicine, becomes more sacred. But there is also an obligation to the men in our profession, our professional brothers. Many of the older pioneers in our state fought for the honor of the individual members of the profession, feeling, as you and I should, that when anyone is assailed by slander the whole membership suffers.

Malpractice litigation in the main is essentially slander against the whole medical profession and makes it easy for the "I told you so's" to conform to the present day feeling that the medical man is not doing his duty to the citizens of the land, that the sick of this country do not have the best in medical care because of carelessness on the part of the doctor, and that reg-

(Continued on Page 129)

COUNTY OFFICERS' MEETING

Hotel Saint Paul—Saturday, February 24, 1940

The annual County Officers' Meeting of the Minnesota State Medical Association is always of interest to large numbers of physicians who are not, strictly speaking, officers of county or district medical societies.

The program arranged for the 1940 meeting scheduled for Saturday, February 24, at the Saint Paul Hotel, is open to any member of the association. As usual, expenses of the secretary or an alternate representative from each society will be paid.

Frank discussion of the problem of expert medical testimony as it looks to a county attorney will be an important feature of the 1940 program. Mr. James A. Garrity of Moorhead will give this discussion under the title, "The Doctor in Court."

Among other guest speakers of particular in-

terest are Dr. C. M. Peterson of Chicago, secretary of the American Medical Association's Council on Industrial Health, who will talk on the work of his council; Dr. R. G. Leland, also of Chicago, director of the American Medical Association's Bureau of Medical Economics, who will talk about national plans for health legislation, and Mr. Walter Finke of St. Paul, director of the new Division of Social Welfare, who will discuss the new medical program of his division. The new program was, incidentally, drawn up with the aid of his medical advisory committee and approved by the Council.

Round table breakfast discussions on subjects of current importance to Minnesota physicians will open the day's sessions. Breakfasts will be served at 8:30 and will be open to all physicians.

The complete program follows:

PROGRAM

8:30 a.m.—Round Table Breakfasts

1. Vaccination and Immunization Campaigns
—L. R. CRITCHFIELD, M.D.

Discussion of Local Organization, Methods, Charges

2. Relations with the University Hospitals and State Institutions

GEORGE EARL, M.D.

Discussion of Admissions and Discharges as Related to Eligibility and Subsequent Coöperation with Local Physicians

3. Inter-Professional Relations

J. M. HAYES, M.D.

Discussion of Local Relations with Allied Groups Such as Dentists, Pharmacists, Lawyers

4. Proposed Legislation for a Federal Hospital Building Program

L. L. SOGGE, M.D.

Discussion of Needs in Minnesota, Population to be Served, Number of Beds, Administration and Control, Future Uses

5. Medical Relief Problems

W. A. COVENTRY, M.D.

Discussion of the Law Relating to Choice of Vendor, also of Fees for Indigent Cases, Farm Security Clients, Authorizations, Hospitalization

10:00 a.m.—General Session

Presiding Officer—B. B. SOUSTER, M.D., St. Paul
Survey on Methods of Handling Medical Relief in Minnesota: Report

—W. A. COVENTRY, M.D., Duluth

Rôle of the County Contact Committee in the New Social Welfare Program

—A. W. ADSON, M.D., Rochester

Extension of Group Hospital Service

—A. M. CALVIN, St. Paul

County Fracture Programs

—R. C. WEBB, M.D., Minneapolis

Industrial Health

—C. M. PETERSON, M.D., Chicago

The Doctor in Court

—JAMES A. GARRITY, Moorhead

12:00 m.—Luncheon

Presiding Officer—B. S. ADAMS, M.D., Hibbing
Medical Program of the Division of Social Welfare

—WALTER W. FINKE, St. Paul

National Health Program

—R. G. LELAND, M.D., Chicago

Continuation Study Courses

—W. A. O'BRIEN, M.D., Minneapolis

Public Health Discussions in County Medical Societies

—O. O. LARSEN, M.D., Detroit Lakes

Board of Health Program for 1940

—A. J. CHESLEY, M.D., Minneapolis

"IN JUDGMENT"

(Continued from Page 127)

ulations and laws must be passed to regiment the practice of medicine.

Undue criticism by any unthinking man is a despicable thing, especially when used to increase his own prestige at the expense of another. Certainly no one is so blind as he who cannot see that there will be a reflection on himself.

Your Medical Advisory Committee believes that a knowledge, not an abuse, of our responsibility to each other guarantees an abundance of satisfaction and will help in the moulding of public opinion to our way of thinking.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Saint Paul Abortinist Sentenced to Two-Year Prison Term

Re: State of Minnesota vs. Arthur N. Alexander.

On December 9, 1939, Arthur N. Alexander, forty-eight years of age, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of abortion. Following a statement of the facts to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Alexander was sentenced by the Honorable Arthur W. Selover, Judge of the District Court, to a term of not to exceed two years at hard labor in the State Prison at Stillwater.

Alexander was arrested by the St. Paul Police Department at his residence at 78 North Smith Avenue on December 6, 1939, following the signing of a complaint against him by the husband of a 41-year-old Minneapolis woman upon whom Alexander performed a criminal abortion on November 21, 1939. Alexander had gone to the home of this woman in Minneapolis and offered to perform this abortion for a fee of \$25.00. He was given \$5.00 at the time, but the balance was not paid for the reason that the patient became seriously ill and was removed to the Minneapolis General Hospital. The matter was referred to the Women's Bureau of the Minneapolis Police Department with Alexander's arrest immediately following. Upon being arraigned in the Municipal Court, Alexander's case was continued and his bond fixed in the sum of \$5,000. He later decided to plead guilty with the above result.

Alexander formerly held a license to practice chiropody in the State of Minnesota. This license was revoked by the Minnesota State Board of Chiropractic Examiners on September 19, 1935, at which time Alexander entered a plea of guilty in the District Court of Ramsey County to an information charging him with practicing healing without a basic science certificate. For that offense Alexander was sentenced to a term of one year in the Saint Paul Workhouse and placed on probation. Since that time, he told Judge Selover, he had worked as a clerk and as a salesman for summer resort property. Alexander has had numerous difficulties with the law, having been arrested in Saint Paul on eight occasions between 1933 and 1935, several of the charges against him being drunkenness. In the present case, Alexander thought he should be

placed on probation, but he was promptly told by Judge Selover that with his previous bad record, he did not deserve to be placed on probation, and accordingly was sentenced to the prison term. The investigation conducted in the current prosecution also disclosed that Alexander had performed a criminal abortion upon another Minneapolis girl for which he was paid the sum of \$45.00.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very fine coöperation received in this case from the Women's Bureau of the Minneapolis Police Department, and particularly from Lieutenant Blanche Jones, head of the Bureau, and Mrs. Edith Evans, policewoman. Some splendid results have been achieved in Minneapolis in this class of cases, and a large portion of the credit is due to the very prompt and efficient investigations conducted by the Women's Bureau. It has been a pleasure for the Minnesota State Board of Medical Examiners to coöperate with that Department.

Unlicensed Physician Sentenced to 50-Day Jail Term at Slayton

Re: State of Minnesota vs. John G. Halland.

John G. Halland, forty-six years of age, who formerly was licensed to practice medicine in the State of Minnesota, was sentenced on November 29, 1939, by Justice of the Peace J. K. Campbell, at Slayton, Minnesota, to a term of 50 days in the County Jail, the sentence to be served in the County Jail of Cottonwood County. Judge Campbell found Halland "guilty of interfering with the rural schools of Murray County by frightening the teachers and inspecting school records without proper authority from the County Superintendent or the Commissioner of Education."

Halland graduated from the Medical School of the University of Minnesota, in 1919, with the degree of Bachelor of Medicine. His license as a physician was revoked by the Minnesota State Board of Medical Examiners in November, 1931, because of habitual indulgence in the use of drugs. Halland has not been licensed to practice medicine in Minnesota since that time. He has a long record of difficulties with the law dating back to 1925, when he served one year in jail at Santa Fe, New Mexico, for a violation of the Federal Narcotic Law. In 1927-1928 Halland served fourteen months in the Federal Penitentiary at Leavenworth for a similar offense committed at Denver, Colorado. In 1932, he served seventy days in the Minneapolis Workhouse. In September, 1933, he pleaded guilty in the District Court at Fergus Falls to an information charging him with the crime of practicing medicine without a license. He received a suspended sentence of six months at that time.

Minnesota Physicians Reprimanded for Failure to File Birth Certificates

Following repeated complaints from the Division of Vital Statistics of the Minnesota Department of Health that certain members of the medical profession in Minnesota were violating the laws of this State in reference to the filing of birth certificates, the Minnesota State Board of Medical Examiners ordered an investigation to be made to determine the facts and what steps are necessary to be taken to secure the coöperation of those physicians who repeatedly neglect, or refuse, to comply with those laws. That investigation disclosed that a small number of physicians have repeatedly failed to comply with the birth registration law and with no plausible explanation for their failure. At the November, 1939, meeting of the Minnesota State Board of Medical Examiners one physician was ordered to appear before the Board and explain his repeated failure to comply with those laws. The facts in that case indicate that it was necessary for the State Department

of Health to send him nine letters in a period of four years in their attempt to secure birth certificates in cases attended by that physician. In addition, a personal call had been made upon the physician by a representative of the State Department of Health and also by a representative of the State Board of Medical Examiners. Despite the leniency extended this physician he still had outstanding two birth certificates, one as far back as March, 1939, and another in June, 1939. In this case the physician was advised by the State Board of Medical Examiners that unless he complies with the law in the future, a citation will be issued requiring him to show cause why his license as a physician should not be suspended or revoked.

The investigation made by the Medical Board clearly shows that the State Department of Health has been extremely lenient with the medical profession in this problem. On the other hand, there is no good reason why it should be necessary for local registrars and the State Department of Health to spend a great deal of time and money securing birth certificates from the attending physicians. It is not the desire of the State Department of Health to be severe, nor unreasonable, in the enforcement of the laws pertaining to births, nevertheless, it is very apparent that the law must be enforced and that it is of extreme importance to the patient, to the child, to the public in general, and to governmental authorities, that these certificates be filed. The law itself is very simple; the pertinent portions thereof could be summarized as follows:

1. The law requires the physician or midwife attending the birth of any child to subscribe and file a birth certificate with the local registrar within five days after the birth of the child.
2. If no name has been given the child within that time, the attending physician or midwife shall deliver to the parents a blank for a supplemental report of the given name of the child.
3. The law also provides that when a certificate of birth is filed without the given or baptismal name the local registrar shall deliver to the parents a blank for a supplemental report of the name.
4. If the child is illegitimate the name, residence and other identifying details relating to the father cannot be entered in the birth certificate without the consent of the father.
5. The law also provides that any person who shall violate any of the provisions of the law shall be guilty of a misdemeanor and shall be punished by a fine of not more than \$100.00 or imprisoned in the county jail for not more than ninety days.

Most of the violations of this law on the part of the medical profession are occasioned by the failure of the attending physician to file the birth certificate within the statutory period. The great majority of the physicians in Minnesota file these birth certificates promptly and within the period provided by the law. It is the hope of the Minnesota State Board of Medical Examiners that those physicians who are violating this law will make it a point, in the future, to comply with it. Certain it is that further violations of the law will result in the suspension of the medical licenses of the physicians involved.

Ely "Rheumatism Doctor" Sentenced to Six-Months Jail Term

Re: State of Minnesota vs. J. F. Brown, alias William Brown.

On December 14, 1939, J. F. Brown, also known as William Brown, sixty-four years of age, of Ely, Minnesota, entered a plea of guilty before the Honorable Edward Freeman, Judge of the District Court of St. Louis County, at Virginia, Minnesota, to an information charging him with practicing healing without a

basic science certificate. After a statement of the facts to the Court by Mr. John Arko, Assistant County Attorney, Judge Freeman sentenced Brown to a term of six months on the St. Louis County Work Farm. Judge Freeman told Brown that, after he had served thirty days of the sentence, the Court would suspend the remaining five months and place Brown upon probation for one year, upon the condition that he absolutely refrain from practicing healing in any way, shape or manner.

Brown, a Negro, who gave his birthplace as San Antonio, Texas, was arrested on December 13, 1939, following an investigation by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, which investigation disclosed that Brown had been representing himself as a rheumatism doctor and had been giving various medications to patients for which he charged sums ranging from \$1.00 to \$2.00 per treatment. He also attempted to give massage treatments and used a so-called sun lamp in connection with his work. Upon being questioned, Brown admitted that he had no medical training whatsoever, but that he had been employed for many years as a shoe shiner and pants presser. He stated that he had lived at Houghton, Michigan, for twenty years and had been on the Minnesota Iron Range once before in 1927, after which he lived, for a number of years, at Duluth. He stated that because of his inability to find any work he turned to the unlawful practice of medicine to make his living. Brown's patients were men employed in the iron mines. Upon being questioned concerning the source from which he obtained his various medicinal preparations, Brown replied that he bought them from one H. P. Clearwater, Ph.D. The pamphlet indicates that Clearwater is a licensed pharmacist in the State of Maine. This case again emphasizes the ease with which an unsuspecting public is victimized by unscrupulous individuals.

Minneapolis Naturopath Sentenced to 4-Year Prison Term for Abortion

Re: State of Minnesota vs. Thomas N. Visholm.

On January 15, 1940, Thomas N. Visholm, seventy-six years of age, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed four years at hard labor in the State Prison at Stillwater, Minnesota. Visholm had previously pleaded guilty, on December 22, 1939, to an indictment charging him with the crime of abortion committed on or about December 14, 1939, at the defendant's combination office and residence at 2312 Humboldt Ave., South, Minneapolis. Following an investigation of the case by the Probation Office of Hennepin County, and a statement to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, Judge Reed stayed the execution of the sentence and placed Visholm on probation for a period of five years, during which time Visholm will be subject to the rules and regulations of the Probation Officer, and, among other things, he is to absolutely refrain from practicing healing in any manner in the State of Minnesota.

Visholm was arrested following an investigation by the Women's Bureau of the Minneapolis Police Department of a report that a criminal abortion had been performed by him on an unmarried girl who resides at New Brighton. At the time of his arrest deputy sheriffs and police officers seized Visholm's surgical instruments and equipment used by him in the performing of criminal abortions. The girl who had been aborted was taken ill and removed to the Minneapolis General Hospital. She has recovered and has been discharged from the hospital. The girl stated that she paid Visholm \$50.00 for his services. Visholm stated that

(Continued on Page 148)

OF GENERAL INTEREST

Dr. C. R. Chadbourne has disposed of his practice at Janesville and will move to Saint Paul, where he expects to continue his medical practice.

* * *

Dr. Clifford T. Wadd of Waseca has purchased the practice of Dr. C. R. Chadbourne in Janesville. Dr. Wadd is a graduate of the University of Minnesota and had practiced in association with Dr. O. J. Swenson at Waseca the past year and a half.

* * *

Dr. Everett B. Coulter, a former member of the staff of Minneapolis General Hospital, has opened offices in Madelia, Minnesota, for the general practice of medicine.

* * *

Dr. Gordon C. Edwards and family, formerly of Kokato, are now making their home in Saint Louis Park. Dr. Edwards has been granted a scholarship for a year's study at the University of Minnesota and later will enter public health work.

* * *

Dr. C. E. Johnson, who has been engaged in government work at Blackduck for some time, has returned to Pine River and will resume his medical practice there.

* * *

Dr. M. J. McMahon and family of Green Isle left early in January for New Orleans, where they will spend several months. Dr. McMahon will devote his time to taking a postgraduate course at Tulane University.

* * *

With the start of the new year, Dr. B. F. Osburn of International Falls turned over the operation of the Northern Minnesota hospital to Dr. C. C. Craig and Dr. R. H. Monahan and has retired from the active practice of medicine.

* * *

Dr. O. J. Johnson of Lyle has announced his association in practice with Dr. A. W. Allen at Austin. Dr. Johnson will continue his Lyle practice and will also continue to reside there.

* * *

Dr. J. A. Mason of International Falls, who has been associated in the practice of medicine with Dr. B. F. Osburn for four years, announces that he has established his own office in the First National Bank Building.

* * *

Oculists particularly are warned against the crooked tactics which have been used by a swindler, apparently for some time, on members of their specialty. The man is about forty-nine years old, approximately five feet ten inches and weighs about 155 pounds. He has light sandy hair, blue eyes and a ruddy complexion and is smooth shaven. His stunt is to be fitted for glasses and

then for payment presents a check, usually for \$30.00, asking for the difference in cash. He apparently gives the impression of being an honest farmer, for he has swindled oculists in Missouri and North Carolina.

* * *

Dr. Norbert J. Lilleberg has become associated with Dr. Lee W. Barry, with offices at 814 Lowry Medical Arts Building, Saint Paul, in the practice of obstetrics and gynecology.

* * *

Saint Joseph's Hospital, Saint Paul, has recently purchased 50 milligrams of radium for the use of members of its staff. A fee schedule comparable to those in use at the other hospitals in Saint Paul has been established.

* * *

Pneumonia Serum

Owing to lack of funds, free distribution of pneumococcic serum was limited to Type I and II beginning July 1, 1939. In November certain available federal funds made it possible again to provide specific serum for all the types of pneumococcic pneumonia and to continue the twenty-four-hour typing service.

* * *

The coöperation of American citizens is asked by the Bureau of Census of the Department of Commerce in its decennial census to be taken this year. The census will inquire into population, occupations, housing, agriculture and business in general. Answers to questions are required by law and are confidential. The Division of Vital Statistics in the Census Bureau is one of the important activities of the Bureau.

* * *

Dean Harold S. Diehl of the University of Minnesota Medical School has been appointed a member of the National Advisory Health Council of the United States Public Health Service. The primary function of this Council is to advise with the Surgeon-General concerning the scientific and research work of the Public Health Service.

* * *

Dr. Ruth E. Boynton, Director of the University of Minnesota Students' Health Service and Professor of Preventive Medicine and Public Health, has been elected as President of the American Student Health Association.

* * *

Dr. George L. Streeter, Director of the Carnegie Laboratories at the Johns Hopkins Hospital, Baltimore, visited the University of Minnesota Medical School on January 17 and 18. He lectured before the medical faculty and students on "Early Stages of Macaque Development and Their Significance in Primate Embryology."

* * *

Dr. Albert V. Stoesser, Associate Professor of Pediatrics, University of Minnesota, has received a grant-

IN MEMORIAM

in-aid from the John and Mary M. Markle Foundation in support of his studies on water and electrolyte metabolism in intractable asthma.

Dr. C. Meredith Guernsey, University of Minnesota, M.D. 1934, who has been associated with the division of surgery of the Mayo Clinic and Mayo Foundation since 1935, has recently moved to Chico, California, where he has taken over the position of Surgeon to the Chico Clinic and the Enloe Hospital.

Mrs. John Dwan has made a gift of \$5,000 to the Minnesota Medical Foundation for support of the program of the Human Serum Laboratory, which was established at the University of Minnesota Medical School in 1938. The Laboratory is administered by a committee including Dr. Irvine McQuarrie, Dr. Paul Dwan and Dr. Erling Platou as a research and service project on the use of human serum for the prevention and treatment of certain infectious diseases.

In Memoriam

Ernest H. Bohland

1874-1940

Dr. Ernest H. Bohland died suddenly at his home in Saint Paul, 144 North Lexington Parkway, January 10, 1940.

He was born in Saint Paul, October 12, 1874, attended the Saint Paul public schools and Macalester College prior to the study of medicine. He received his M.D. from the Hamline Medical School in 1903. Later, he did post-graduate work at Rush Medical School. He practiced at Hanover, Minnesota, for two years and then came to Saint Paul, where he maintained an office at Goodrich Avenue and West Seventh Street throughout his career. In addition, he had an office association with Drs. Goodrich, Dennis and Gilfillan, and later with Drs. Savage, Brand and Nichols. He was on the staffs of St. Joseph's, St. Luke's, the Miller and the Children's Hospitals. He belonged to the Odd Fellows, and was a member of the Parish of St. Luke's and of the University Club.

In 1909, he was married to Miss Laura Taillefer.

There were few sports in which Dr. Bohland did not take part. In his early days he was on the racing squad of the Minnesota Boat Club; in his college days he was active in track athletics and football, and later in life a devotee of golf. He did a good deal of bird shooting, deer hunting and fishing.

To those of us who knew him best, his outstanding characteristics were his integrity, honesty and sincerity of purpose.

Surviving him are his wife; a daughter, Mary; a

son, Taillefer; a brother, John A. Bohland; and three sisters, Mrs. James E. Orme, Miss Beatrice Bohland and Mrs. J. S. Sweitzer.

Charles Rasmi Christenson

1867-1940

Dr. C. R. Christenson of Starbuck, Minnesota, died January 14, 1940. Death was due to a perforated peptic ulcer.

Dr. Christenson was born at Portage, Wisconsin in 1867. He received his early education in Owatonna. After studying a year at the University of Minnesota he taught school for two years and then returned to the University of Minnesota where he received his M.D. degree in 1895. He spent the next year as interne at Saint Barnabas Hospital in Minneapolis.

After moving to Starbuck in 1896, Dr. Christenson on several occasions took postgraduate work in Chicago, Philadelphia and Boston. In 1914 he traveled abroad, visiting the Scandinavian countries and Germany.

In September, 1917, Dr. Christenson sold his equipment and moved to Morris where he remained until he entered the Army Medical Corps at the time of the World War. He was stationed at Battle Creek, Michigan. Following the war he returned to practice at Morris until 1922 when he returned to Starbuck. At various times he was a member of the school board, coroner, a member of the council and mayor of Starbuck.

In 1930 he moved to Minneapolis where he practiced until 1936. In 1936 he again returned to Starbuck.

Dr. Christenson was a member of the Minnesota State and American Medical Associations until 1936.

George A. Kohler

1863-1940

Dr. George A. Kohler, Minneapolis, died January 9, 1940, at the age of seventy-six.

Dr. Kohler was born at Long Lake in 1863 and moved to Watertown, where he received his early education. He was a graduate of the Northwestern University School of Pharmacy and the Illinois College of Pharmacy. After graduating from Hamline Medical College in 1900 he attended the Polyclinic of Chicago and took postgraduate work in Vienna. Upon returning he practiced his specialty of eye, ear, nose and throat in Minneapolis from 1900 until 1939.

Dr. Kohler was member emeritus of the Hennepin County Medical Society, the Minnesota State and American Medical Associations. He was a Master Mason of the Watertown Lodge, No. 50, A. F. and A. M., and was a member of the Darius Commandery No. 7, Knights Templar, and an honorary life member in the Zuhrah Temple of the Shrine. He was a member of the medical corps during the World War. He also had membership in the Minneapolis Athletic Club.

Dr. Kohler is survived by a daughter, Louise Kohler

IN MEMORIAM

Hackett, of Minneapolis, and a son, George A. Kohler, Jr., of Lansing, Michigan.

James McCrea

1863-1939

Dr. James McCrea of Fulda died at his home December 19, 1939, after an illness of several months. He was seventy-two years old and had practiced in Fulda fifty-three years.

Dr. McCrea was born at Franktown, Canada, September 25, 1863. He graduated from the Ottawa Normal School in 1885 and taught school in Canada for nine years before studying medicine at McGill University. There he received his medical degree in 1894. The same year he was licensed in Minnesota and South Dakota. He practiced for several months in Salem, South Dakota, and in 1895 went to West Concord, Minnesota, for six months.

On August 1, 1895, Dr. McCrea was married to Emma Schneider of Salem, South Dakota. Dr. and Mrs. McCrea moved to Fulda in March, 1896, and had lived there since that time.

Dr. McCrea had an extensive obstetrical practice and kept abreast of the times. His early practice was in the horse and buggy days when good roads were the exception. He was one of the incorporators of the Citizens State Bank and was active in its management since its incorporation in 1908.

Dr. McCrea was a member of the Southwestern Minnesota Medical Association, the Minnesota State and American Medical Associations.

Owen McKeon

1874-1940

Dr. Owen McKeon, Saint Paul, died at his home, January 4, 1940, on his sixty-eighth birthday, following a heart attack.

Dr. McKeon was born in Henderson, Minnesota, January 4, 1874. He received his medical degree from the Minneapolis College of Physicians and Surgeons in 1900 and received his state license the same year.

After practicing three years in Saint Michael, Minnesota, he moved to Saint Paul, where he continuously practiced his profession.

Dr. McKeon was a member of the Hibernians, Catholic Order of Foresters, Knights of Columbus and for many years a member of the Ramsey County Medical Society and the Minnesota State and American Medical Associations. He was much interested in Boy Scout activities.

Dr. McKeon is survived by his widow, one son, Frank J., of Saint Paul, and two daughters, Gertrude McKeon and Mrs. Phillip A. Delavan of Saint Paul. He also is survived by two brothers, Patrick of Saint Paul and Dr. Philip McKeon of New Richmond, Wisconsin.

Frederick H. Neher

1891-1939

Dr. Frederick H. Neher was born September 9, 1891, in the family home of his father, Frederick Neher, and mother, Anna Koegler Neher, on the West Side of the city of Saint Paul, Minnesota. He received his grade school education in St. Matthew's Parochial School on the West Side, following which he attended St. Thomas High School for four years. His first year of pre-medical work was taken at the University of Minnesota, after which he transferred to Marquette University in Milwaukee, where he received his Doctor of Medicine degree in 1915. He spent a year of internship at the City and County Hospital in Saint Paul, following which he associated himself with Dr. Herbert Davis until he entered the Army shortly after the United States entered the World War in the spring of 1917.

While associated with Dr. Herbert Davis he spent his mornings assisting Dr. Comstock with his surgery. During his service in the United States Army he served in the cavalry, spending a few months at Harvard University in orthopedics. Shortly after the Armistice was signed he was honorably discharged and returned to Saint Paul, renewing his association with Dr. Comstock. After a few years of this association he became an assistant to Dr. Frederick Schuldt of Saint Paul, later leaving Dr. Schuldt to become associated with Dr. Edgar Norris. This association was continued until Dr. Norris was forced to leave practice due to ill health. Following this he was associated with Dr. John Hochfilzer and Dr. H. J. Prendergast. In January, 1931, it was the writer's privilege to become associated with Doctors Neher and Hochfilzer and my association with Dr. Neher continued until his lamentable death.

On July 12, 1922, Dr. Frederick H. Neher was married to Cecelia Kilbane. This marriage was blessed with two offspring, Frederick Neher, Jr., aged fourteen, and James Neher, aged four.

On November 23, 1939, due to an injury sustained to a boil on his arm, he became the victim of a staphylococcus septicemia which necessitated his hospitalization on November 27, 1939, and caused his death on December 6, 1939.

During the many years of my association with Dr. Neher it was my privilege to understand and enjoy his very mellow humor and outspoken frankness in all matters. His jolly pantomime manner in narrating all stories was thoroughly enjoyed by the entire medical profession of this Association. As so tersely stated by a member of our Association, "Dr. Neher was truly more than a member of the medical profession, he was an institution in himself."

He was a member of the American Medical Association, the American College of Surgeons, Minnesota State Medical Association and the Ramsey County Medical Society. He also was a charter member of the Saint Paul Surgical Society and an active member of the Medical Forum in Saint Paul.

EUGENE SCOTT, M.D.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

February 3—Cause of Dyspepsia

February 10—Peptic Ulcer

February 17—Cancer of Stomach

February 24—Periodontia

STATE MEETING

Plans are now being completed, according to the Committee on Scientific Assembly, for the Scientific Exhibit of the 87th Annual Meeting scheduled for April 22, 23, and 24 at the new Mayo Civic Auditorium in Rochester.

Members who have exhibits to submit for this section of the meeting are urged by committee members to communicate immediately with the State Office, 493 Lowry Medical Arts Building, Saint Paul.

There are still a few openings on the Scientific Cinema program, also for motion pictures. Any information about interesting new pictures will be welcomed by the committee.

Three-quarters of an hour each morning and afternoon have been set aside for viewing scientific and technical exhibits, the scientific cinema and demonstrations, and no other sessions whatever will be allowed to interfere during these hours. The splendid facilities available in the Arena of the fine new Auditorium are expected to contribute materially to this section of the program.

Members of the Mayo Clinic staff will stage the entire program for Monday, April 22, including regular scientific sessions, ten Round Table luncheons at the Rochester hotels and an Open House at night in the Arena. Music, entertainment and refreshments will be provided and exhibits will be open for inspection.

Programs for Tuesday and Wednesday, April 23 and 24, are reserved for other state and out-of-state speakers. There will be Round Table luncheons on these days, also, with guest speakers and Minnesota experts acting as leaders on both days. Programs for the general sessions are built around the following subjects: Fractures, Coronary Disease, Radiology, Pre-operative Care, Cancer of the Breast, Progressive Loss of Vision and Child Psychiatry. The last two subjects, scheduled for Wednesday afternoon, April 24, are of especial interest to teachers and school nurses as well as physicians and the final session, accordingly, will be

thrown open to these and other interested outside groups as a climax to the meeting.

The regular Association banquet will take place Tuesday night at the Rochester State Hospital.

Among the outstanding guest speakers who have already accepted invitations to speak at the meeting are: Drs. Paul Magnuson, Harry Mock and Fred L. Adair of Chicago; Bernard H. Nichols of Cleveland; John O. Bowers of Philadelphia and Russell L. Cecil of New York.

Members of the Women's Auxiliary of the Association will hold their annual gathering at the same time, joining with the physicians for the Monday night open house and the banquet.

WASHINGTON COUNTY SOCIETY

The regular monthly meeting of the Washington County Medical Society was held January 9 at the usual time in the Stillwater Club rooms. Considering the weather, the attendance was fair.

A communication from Dr. Chesley on pneumonia typing and serum distribution was read, as was the monthly letter from the Executive Secretary of the State Association.

Two new members, one by card from St. Louis County, Stella L. Wilkinson, M.D., and one by application in the regular way, Carnot H. Sherman, M.D., of Bayport, were certified to by the Board of Censors and the vote for their membership was unanimous. Bernard Street, M.D., was transferred as of January to the State's Institution at St. Cloud, where he will be in charge. With him and his bride go the good wishes of the Society.

William von der Weyer, M.D., of Saint Paul gave a liberally illustrated lecture on "Hip Fractures." He pointed out physiologic reasons for the prevalence of such fractures at certain ages and described the different treatments, surgical and non-surgical, now in vogue. The very marked improvement in the treatment of such fractures has greatly increased satisfactory en-results, both as to life and restoration of normal or nearly normal functions. He showed and explained the instruments used by himself when surgical treatment is required.

WEST CENTRAL SOCIETY

The West Central Medical Society met in Morris, October 13, 1939. Dr. B. J. Branton of Willmar gave a short talk on malpractice. The society gave him a vote of thanks for his work. Dr. H. E. Richardson of Saint Paul gave a very interesting talk on "Diagnosis of Heart Diseases," and Dr. R. N. Barr from the State Board of Health talked on "Pneumonia: New Methods of Treatment."

Drs. I. L. Oliver, F. W. Behmler and E. M. Elsey were appointed on the fracture committee. Dr. Glesen and Dr. Robert Merrill were appointed to take a course at the University in the "Problems of Premature In-

WOMEN'S AUXILIARY

phants. Drs. L. P. Mooney and F. W. Engdahl were appointed alternatives.

According to a New Year's letter sent to members of this society by the secretary, Dr. Herman Linde, four meetings with an average attendance of fifteen were held during 1939. The present membership is thirty.

Of the original fourteen charter members, when the society obtained its charter on October 21, 1902, six are still active—Drs. Bolsta, Caine, Christensen, Elsey, Larson and Oliver. Four new members joined during the year, and one member was lost through death.—Dr. J. F. Cummings of Morris.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

More than 10,000 papers on the subject, "Youth's Health Security," were written by Minnesota High School students in the Christmas Seal High School Radio project which is conducted under the auspices of the Minnesota Public Health Association and the Women's Auxiliary of the Minnesota State Medical Association.

A total of 102 talks selected as best from the 10,000 were submitted in the state contest. All of these had been presented by the author before local groups.

Writers of the six papers selected as best from the 102 entries presented their talk over WCCO in the final competition. They were Gloria Reel of the Cathedral High School, Saint Cloud; Barbara Zeches of the St. Charles High School, Saint Charles; Alice Hagen of the Washington High School, Brainerd; Ruth Schmiede of the Grand Rapids High School, Grand Rapids; Carl Baumgaertner of St. Thomas Military Academy, Saint Paul; and Corinne Erling of the Aitkin Junior High School, Aitkin.

Finalists who won the school trophies were in the junior contest—Corinne Erling; in the senior contest—Carl Baumgaertner.

Each of the six students who broadcast was presented with a gold medal, a gift of the Women's Auxiliary.

Representing the Auxiliary on the programs given in connection with the project were Mrs. Martin Nordland, Minneapolis, who for many years has been one of the judges in the contest, and Mrs. J. J. Ryan, Saint Paul, vice president, who appeared in place of Mrs. A. C. Baker, Fergus Falls, president, who was unable to attend.

Reports indicate that in some schools every student did research work and wrote a paper on tuberculosis as a part of this project.

Blue Earth County

The Blue Earth Auxiliary held its fall meeting at the home of the president, Mrs. W. C. Stillwell, Mankato. Mrs. George Earl of Saint Paul was a guest. After the regular business meeting Mrs. R. N. Andrews reviewed the play "The American Way." This was fol-

lowed by a social hour with the doctors. About forty members attended.

* * *

Clay-Becker Counties

Members of the Clay-Becker Medical Auxiliary held their winter meeting December 15, 1939, and elected the following officers: President, Mrs. O. O. Larson, Detroit; vice president, Mrs. H. G. Rice, Moorhead; secretary-treasurer, Mrs. L. Plancher, Detroit.

This Auxiliary has been active in sponsoring a sale of articles made by the patients at Sand Beach Sanatorium which netted \$75.85 for the patients. The proceeds are used by the patients for their Christmas spending. The Auxiliary has also placed *Hygeia* in all the county public libraries.

* * *

Red River Valley

Mrs. A. C. Baker, President of the Women's Auxiliary of the Minnesota State Medical Association, attended the joint meeting of the Red River Valley Medical Society and the Women's Auxiliary, which was held in Crookston, Minnesota, December 14, at the Crookston Hotel. Dr. W. L. Burnap of Fergus Falls talked on "The Wagner Bill" at the dinner meeting and Mrs. Baker brought greetings from the State Auxiliary.

Following the meeting, members of the Auxiliary adjourned to the home of Mrs. W. G. Paradis, where Dr. Burnap continued his discussion of the Wagner Bill, and Mrs. C. L. Oppegaard reported on the Christmas Seal essay contest. The committee on *Hygeia* is composed of Mrs. S. H. Stuurmans of Erskine, Mrs. W. G. Tanglim of Mahanomen, Mrs. H. Hedemark of Thief River Falls, Mrs. Blegen and Mrs. Allen Sather of Fosston, Mrs. C. G. Uhley and Mrs. J. F. Norman of Crookston. A very interesting report was given showing an increase in subscriptions. A nominating committee was appointed by Mrs. Stuurmans, president, and includes Mrs. L. L. Brown, Mrs. O. L. Bertelson and Mrs. Uhley, all of Crookston.

* * *

Stearns-Benton Counties

Stearns-Benton Auxiliary announces the appointment of Mrs. R. N. Jones, St. Cloud, Minnesota, as their new Publicity and Press Chairman.

* * *

Washington County

The Washington County Medical Auxiliary held the November meeting at the home of Mrs. D. Kalinoff in Stillwater. The business session was followed by an afternoon of sewing for Lake View Memorial Hospital.

The annual Christmas party and meeting were held December 12 at the home of Mrs. R. G. Johnson, Stillwater. Each of the twelve members came dressed to represent a song. After a brief business meeting the afternoon was devoted to games and a visit from Santa. Luncheon followed the meeting.

The January meeting was held at the home of Mrs. E. V. Strand, Bayport, Tuesday evening, January 9, at 7 o'clock. A short business meeting was followed by dinner and the remainder of the evening was spent in a social time. Eleven members attended.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of November 8, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 8, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the president, Dr. Carl B. Drake.

There were sixty-one members and one guest present.

The Secretary read a letter from Dr. Walter R. Ramsey, of St. Paul, making application for transfer of his name from the Active to the Senior Membership list. This had been approved by the Executive Committee. Voted upon and accepted by the Academy.

The scientific program followed.

TOTAL EMBOLISM OF THE RENAL ARTERY and PRIMARY CARCINOMA OF THE URETER

F. E. B. FOLEY, M.D.

Saint Paul

Dr. Foley, of Saint Paul, gave the following follow-up reports on two previously reported cases.

1. This case was originally reported at the April, 1938, meeting of the Academy. The previous report may be summarized as follows. The patient was a very obese woman age 55. She had mitral disease and auricular fibrillation. She was admitted to the hospital January 8, 1938, soon after sudden onset of severe left flank pain. There were transient hematuria, exquisite tenderness in the left flank and albuminuria. The following observations were made two days later: enlargement of the left kidney shadow in the radiograph, normal function, and outlining of the right kidney by excretion urography but no outlining whatever of the left renal pelvis and no function of the left kidney. Cystoscopy showed normal excretion of indigo-carmin by the right kidney but no efflux of urine whatever from the left ureter. By aspiration, 2 or 3 c.c. of urine not colored with indigo-carmin were obtained from the left kidney pelvis by ureteral catheter but there was no continuing drip of urine from the catheter and it appeared quite certain the left kidney was secreting no urine. The left retrograde pyelogram showed a general magnification of the pelvis and calyces corresponding to the enlarged renal outline but no obstruction or actual dilatation of the pelvis. The history and findings appeared to warrant a positive diagnosis of total embolism of the left renal artery. The pain gradually subsided and the further course was uneventful. On March 7, 1938, two months following onset, and April 5, 1938, three months following onset, most of the above observations were repeated and on both occasions a normally functioning right kidney and totally non-functioning left kidney were demonstrated. The retrograde left pyelograms made on these two subsequent occasions showed a marked de-

crease in the size of the left renal pelvis corresponding well with the shrinkage to be expected with progress of an autonephrectomy.

Since the original report the patient has continued under observation. The course has been entirely uneventful. Excretion urography and cystoscopy have continued to demonstrate a normally functioning right kidney and total absence of function of the left kidney. Since the original report April 13, 1938, retrograde left pyelograms have been made on May 6, 1938, four months after onset and on August 2, 1939, one year and seven months after onset. These pyelograms are shown in the following lantern slides. It will be noted that shrinkage of the left pelvis has continued and that in the last pyelogram this has progressed to near disappearance of the kidney.

The case illustrates the fact that with total embolism of the renal artery resulting in aseptic total infarction, autonephrectomy will progress without incident.

2. This case was originally reported at the November, 1938, meeting of the Academy. The previous report may be summarized as follows. The patient was a woman aged sixty-nine. There had been a little vague discomfort in the right flank on occasions. In June, 1938, when she first came under observation, gross hematuria was present during one day. A number of subsequent urine examinations all showed the presence of red blood cells. On pelvic examination a small mass corresponding in position to the terminal portion of the right ureter was palpable. A right pyelo-ureterogram showed a grade 2 hydronephrosis with suggestion of obstruction at the uretero-pelvic junction, no significant dilatation of the ureter but a mottled filling defect occupying a segment 4 or 5 cm. in length in the pelvic portion of the ureter. A diagnosis was made of primary tumor of the pelvic portion of the right ureter. Nephro-ureterectomy, right, and resection of the bladder including the uretero-vesical junction (one stage) were performed on July 6, 1938, and were followed by an uneventful postoperative course. On October 12, 1938, pelvic examination disclosed a small mass in the former position of the terminal portion of the right ureter. Whether this represented induration of the repair process or recurrence of the neoplasm was not certain at that time.

Since the original report, the patient has continued under observation. The mass in the right side of the pelvis gradually became larger and it became evident it represented recurrent growth of the neoplasm. Cystoscopy showed invasion of the bladder floor on the right side. A full course of deep x-ray treatment was administered by Dr. Schons. This does not appear to have had a favorable effect, for, at the last pelvic examination, October 17, 1939, the mass in the right

side of the pelvis was definitely larger and cystoscopy showed further extension in the bladder.

The course in this case is in keeping with the unfavorable prognosis usually found in cases of primary tumor of the ureter. The operation here appeared to be just as adequate as is surgically possible. There appeared to be no extension of the growth beyond the ureter and the ureter separated from surrounding structures with no difficulty whatever. The kidney, ureter and an elliptical segment of bladder wall with the uretero-vesical junction at its center were all excised intact. In spite of this, there is recurrence and certainty of an eventually fatal outcome.

Discussion

DR. ARNOLD SCHWYZER, Saint Paul: As to the first case of total embolism of the renal artery, I would like to have a little more information. When at operation you close the artery by finger pressure, the kidney becomes very much smaller right away. Here the kidney shadow was, in the first x-ray, considerably increased. Furthermore, there was blood in the urine. The question came to me, when I saw the picture, whether that was an embolism of the renal artery or a thrombosis of the left renal vein. The blood from the left spermatic vein enters the left renal vein, which then has to go underneath the superior mesenteric vessels and over the aorta to the vena cava. The venous flow is, therefore, not as free as on the right side. With the vein thrombosed, one could better understand why there was such a very great increase in the size of the kidney.

As to the second case, I wonder whether a second operation and resection would not be possible as long as the histologic picture is not very bad. A good clean excision ought to be possible and it would not be so very difficult.

DR. S. MARX WHITE, Minneapolis: Since I may lay claim to being a reformed pathologist, I might attempt an explanation supporting Dr. Foley's thesis, i.e., that, as the result of total infarction of the kidney, there is first swelling and enlargement of that organ and later contraction with diminution in size. I have had the opportunity to observe at autopsy many instances where large and smaller infarcts have occurred in the kidney. Soon after infarction has occurred the area involved is increased in size and sometimes considerably so. As time goes on this swelling diminishes and the end-result may be a scar of considerable size with pronounced shrinkage in the total mass. The same relations of early swelling and later atrophy can be observed from time to time in the brain. After death of an area in such an organ the cells and tissues imbibe fluids, the mass becomes enlarged, but these fluids are eventually abstracted in the process of organization and scar formation.

I do not recall having seen at autopsy a case of total infarction of the kidney but would expect, when this occurs, that the surrounding tissues such as the renal capsule, the circulation of which might not be involved, would furnish fluids so that swelling of the whole organ should occur similar to that seen in partial infarction. The fact that the kidney was enlarged soon after the original insult would not necessarily speak against the theory that there was infarction. In my mind, it would speak in its favor, particularly since as time goes on a demonstrated shrinkage in this organ has occurred. In my opinion the kidney shown has gone through the typical and expected evolutions.

DR. FOLEY (in closing): I should reply to Dr. Schwyzer's question concerning the diagnosis in the

case of total embolism of the renal artery. The swelling of the kidney does make one consider the possibility of venous thrombosis rather than embolic occlusion of the artery. Dr. White's comments bear directly on the question. It may be that, at the onset, the arterial occlusion is not complete and that at first only branches of the artery are obstructed with multiple infarcts with swelling at their peripheries. On the other hand, with complete arterial occlusion and perhaps ischemic damage to the venules, venous pressure may be sufficient to cause the swelling. One would not expect that venous thrombosis would progress rapidly enough to give such sudden onset of severe pain. Moreover, the proved autopsy cases in the literature correspond perfectly to the one here reported. All things considered, I can't feel there should be much misgiving about the diagnosis of embolism.

In the case of primary tumor of the ureter, I felt that the first operation was just as clean and adequate as possible and now with a recurrent, probably infiltrating, growth, I cannot feel that another surgical procedure in my hands would give any promise of success.

GENITAL TUBERCULOSIS

GILBERT J. THOMAS, M.D.

Minneapolis

Dr. Gilbert J. Thomas, Minneapolis, read his Inaugural Thesis on the above subject. (To be published in full in MINNESOTA MEDICINE.)

Abstract

1. Tuberculosis of the genital tract is a local manifestation of a general disease, and lesions here are most often secondary to a primary urinary tract infection in the kidney. The treatment plan of the local genital lesion or lesions must be based on this pathological fact.
2. The route of spread from the kidney to the genital tract is most often via the urine.
3. The primary lesion in the genital tract is most often the prostate gland. From here the infection may spread to the other genital organs. Foci of tuberculosis in the prostate gland may produce no symptoms.
4. The seminal vesicle is infrequently infected with the bacilli of tuberculosis and is most always associated with lesions of tuberculosis in the prostate gland.
5. Tuberculous infection in the epididymis is secondary in the genital tract to tuberculosis in the prostate gland. There may be a subacute stage of tuberculosis of the epididymis which is activated by trauma.
6. Treatment of lesions of tuberculosis in the genital tract consists of:
 - (a) The location and arrest of other lesions of tuberculosis and of the primary focus in the urinary tract by whatever means are necessary.
 - (b) Hygienic treatment of lesions of tuberculosis in the epididymis and heliotherapy to be followed by application of heat, incision and drainage, and surgical removal when indicated.
 - (c) Orchidectomy is rarely necessary.
 - (d) Hygienic treatment for tuberculosis of the prostate gland and seminal vesical after removal or arrest of other active foci in the urogenital tract is always

practiced. Surgical removal of these organs is seldom necessary.

(c) Postoperative rest for three months is always essential.

Discussion

DR. W. F. BRAASCH, Rochester: Dr. Thomas has taken full advantage of his opportunities at Glen Lake Sanatorium to study the cases of tuberculosis of the genito-urinary tract. He has made many interesting and valuable observations over a period of years. In the first place, he has called attention to the frequent occurrence of genito-urinary tuberculosis in cases of pulmonary tuberculosis. I was very much interested the other evening, in talking with Dr. Adamson, Director of the Manitoba Hospitals for Tuberculosis, who told me there had been quite a change in the attitude of physicians in this field toward genito-urinary tuberculosis. Careful examination, including guinea pig inoculations and urographic studies, for evidence of coincident genito-urinary tuberculosis is now usually made in cases with pulmonary tuberculosis and it is surprising how often it is found.

Whether tuberculosis in the genitalia is always secondary to renal tuberculosis, as Dr. Thomas states, or whether it may occur independently, has not been definitely proved. It is my opinion that in most instances tuberculosis in the genitalia has its origin by a retrograde route from infection in the urinary tract. Although the area of renal infection may be very slight and may heal spontaneously in some cases, yet a few tubercle bacilli may suffice to find their way from the urethra so as to infect the prostate gland and other genitalia. On the other hand, autopsy has disclosed the absence of renal tuberculosis in the presence of involvement of the prostate and epididymis. It would seem probable that tuberculosis in the genitalia may in some cases be of hematogenous origin.

Dr. Thomas has shown the great value of rest in bed with renal tuberculosis, as in other forms of tuberculosis. There are those who may not agree with him as to the length of time of rest necessary for either pre- or postoperative treatment, but its value must be recognized.

Tuberculosis of the genitalia may be very difficult to diagnose. Clinical statistics as to the incidence of involvement are not very accurate, since a slight tuberculous involvement may exist with little if any clinical evidence. In the course of the usual autopsy it may be easy for the pathologist to overlook tuberculosis of the genitalia. Without careful pathologic examination, including serial sections of all of the genital organs, the data cannot be very accurate. Exact data covering a large series of cases with complete post-mortem examination are still lacking.

Dr. Thomas is very conservative in his views regarding the treatment of genital tuberculosis and I am inclined to agree with him. On the other hand, Dr. H. H. Young believes that the tuberculous prostate gland, seminal vesicles, vas and epididymis should all be removed en masse, and he is supported in this view by men like Hinman. They claim that the postoperative results are distinctly better. The burden of the proof in a large series of cases is up to them. I formerly was under the impression that there was not much difference in the late results after nephrectomy for renal tuberculosis whether the genitalia were involved or not. However, in recent studies my colleague, Dr. Emmett, found that the late mortality in cases of renal tuberculosis was much higher in the male with clinical evidence of genital involvement than in the female. Whether this difference is entirely due to the infected genitalia is, of course, not proven. It is possible that radical surgical treatment might be considered in some cases. However, the danger of rectovesical fistulae and

incontinence, which have been observed, should make one hesitate.

Dr. Thomas is to be congratulated on his thorough discussion of this interesting subject and for his many valuable observations.

DR. F. E. B. FOLEY, Saint Paul: I too wish to compliment Dr. Thomas on the excellent work he has done the past several years in the field of genito-urinary tuberculosis. He has pursued the subject continuously and well, and in this country has been one of the outstanding contributors of clinical data on the subject. The best lesson we can learn from Dr. Thomas' presentation is that every case of genital tuberculosis, particularly epididymal tuberculosis, warrants a complete urologic investigation; for, in the vast majority of such cases, the genital lesion is secondary to a tuberculous renal lesion. To have had that fact, if nothing else, properly impressed tonight, makes Dr. Thomas' thesis well worth while.

DR. RICHARD HULLSIEK, Saint Paul (by invitation): One point that Dr. Thomas called to our attention is the high incidence of prostatic tuberculosis. I think most urologists readily recognize renal tuberculosis and involvement of the epididymis, but we have not looked often for the prostatic tuberculosis. Fortunately, the prostatic involvement often needs only hygienic treatment with the removal of tuberculosis elsewhere in the tract.

DR. F. R. WRIGHT, Minneapolis: To me this entire question is very interesting and comes down to the question of the curability of tuberculosis in general. Wherever you can get at tuberculosis and remove it, well and good; but when it comes to tuberculosis of the prostate, where one can't remove it, what are you going to do? Can you do anything but put that man out in the sun for ten or twelve years and then is he well? The probability is that sometime in the future we will develop a scheme whereby we can take care of constitutional tuberculosis, but, at the present time, that is a long way in the future.

DR. THOMAS (in closing): First of all, I want to thank the men for their discussions.

Dr. Braasch brought up the question of surgical versus hygienic treatment for tuberculosis of the epididymis. I think both methods of treatment are correct. If the patient has lesions of tuberculosis that have been controlled, indicating that his resistance is good, then I think we are justified in removing surgically an organ or tissues if such surgery will erase all remaining evidence of activity. In deciding treatment, we must not forget that tuberculosis is not alone an epididymal or prostatic infection, or a local condition. These lesions are merely local manifestations of a general disease.

Dr. Wright asks whether a patient who has had tuberculosis is ever completely cured. It is a problem with much debate whether a patient having had spread of tuberculosis from the chest cavity is ever absolutely cured. When discussing genital tuberculosis we never use the term "cured" but supplement "controlled" instead. Many patients with bilateral renal tuberculous lesions have had these under control for a great many years without symptoms. We have not found it necessary to remove surgically the seminal vesicles or prostate because, as mentioned above, when this formidable operation is performed, we are not sure that we have surgically removed all of the tuberculosis that the patient may have.

I would like to emphasize another observation, and that is that the manifestations of spread of tuberculosis from the chest cavity responding to surgical treatment are becoming fewer and fewer each year. One urologist in a large eastern city recently told me that

he now infrequently sees renal or genital tuberculosis in his wards. I visited in a city in Texas last fall with a well-known university having a medical department and large hospital. While there, I was unable to present any patients suffering with urogenital tuberculosis for demonstration purposes during my lecture.

A final statement concerning treatment is necessary.

No matter where the lesion or lesions are located, if proper treatment of the disease tuberculosis is to be carried out, this must include treatment of the patient "as a whole."

The meeting adjourned.

A. G. SCHULZE, M.D., Secretary.

Meeting of December 13, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 13, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the president, Dr. Carl B. Drake.

There were fifty-four members and one guest present.

The Secretary read a letter from Dr. Franklin R. Wright, of Minneapolis, asking that his name be transferred from the Active to the Senior Membership list. This had already been approved by the Executive Committee, and, upon vote, was accepted.

The following men were elected as officers for the year 1940:

President.....James A. Johnson, Minneapolis
Vice President..John M. Armstrong, Saint Paul
Secretary-Treasurer..A. G. Schulze (relected)

The scientific program followed.

Dr. J. A. Lepak read the following inaugural thesis:

HYPOTENSION, LIKE ANEMIA, DEMANDS AN ETIOLOGIC SEARCH FOR APPROPRIATE THERAPY

An Analysis of 627 Cases

J. A. LEPAK, M.D.
Saint Paul

Although hypotension is not a disease, it is frequently associated with manifestations of a diseased or disordered constitution. Then again, in other instances, its presence reveals no evidence of ill health or loss of body vigor. Consequently, such observations must point to the existence of various types of hypotension. In this presentation, therefore, an effort will be made to give the well-known types of hypotension and to discuss especially the etiologic relation to the coexisting disease or disorder in order that rational therapy might be instituted to correct the disturbing factors. Friedlander¹ states that "there is no single explanation which can account for all types of hypotension. It is not always pathological, and where it is a manifestation of a disease, it may depend upon one of several underlying causes, or upon a combination of them."

In the definition of hypotension differences of opinion are numerous. Oliver² maintains that blood pressure below 125 mm. of mercury should be classed as hypotension, while Janeway³ lowers the reading to 100 mm. of mercury. Alvarez's studies⁴ of blood pressure in a group of 6,000 men and 8,934 women reveal an

average systolic pressure of eleven points lower in women than in men. He also noted a slight drop in blood pressure between the ages of seventeen and twenty-one in men, and seventeen and twenty-five in women. Cadbury⁵ and Kilbourn,⁶ independently, studying blood pressures in Chinese young men, found that the systolic pressure averaged from 20 to 30 mm. of mercury lower than in young Americans or Europeans. It is, then, probably conservative to classify any case as hypotension in which the systolic blood pressure reads not more than 100 mm. of mercury.

Just what the characteristic symptoms associated with or resultant from hypotension are, perhaps no one can definitely state. A certain group of symptoms may be found in one case while in another appears a totally different group. Some individuals remain symptomless, others present only a few symptoms, yet a large number show a long series of complaints. Among the most common symptoms enumerated by Roberts⁷ and Taylor⁸ which are associated with hypotension are: loss of former sense of well-being, fatigue, physical exhaustion, motor instability, fears, apprehension, nervousness, insomnia, inability to concentrate, inattention, headache, ringing in the ears, generalized neuralgic pains, abdominal pains, falling asleep of the limbs, precordial pain, angina, dizziness, palpitation, faintness and syncope aggravated by exertion, overeating or emotion, susceptibility to colds, cyanosis of the extremities, gaseous distention, psychoneurosis, and menstrual disturbances and irregularities. To some extent, at least, the symptoms are determined by the suddenness or gradualness in the onset of hypotension. Just what mechanical, chemical or functional processes are involved in the production of hypotension with its train of symptoms is not yet fully known.

Yet despite this incompleteness in medical knowledge certain types of hypotension are clinically fairly well recognized. Thus, an acute hypotension sometimes accompanies an anaphylactic, surgical, or traumatic shock or follows a prolonged deep anesthesia. Severe hemorrhages in wasting diseases frequently produce also an acute hypotension. Less formidable hypotension appears in the acute infectious diseases, such as influenza, typhoid fever, or pneumonia. A failing myocardium, either primary or secondary in origin, accounts for many cases of hypotension. Some patients suffering from certain endocrine disturbances show marked hypotension. Essential hypotension attributed by some to the so-called "constitutionally inadequate individual" is

not very rare. Finally, a very small group is limited to orthostatic hypotension with syncope.

Most authors presume that hypotension results from a disturbance in the factors that maintain normal blood pressure. These factors enumerated by Friedlander²¹ are:

- "1. The force of the cardiac contraction.
- "2. The condition of the blood vessels.
- "3. The peripheral resistance to the blood stream, determined by the vasomotor system.
- "4. The blood volume, and the physical state of the blood itself, its viscosity, et cetera."

Inefficiency of the myocardium caused by severe infection, valvular disease, trauma, toxin, or any other such debilitating agent may produce hypotension. The contraction of the blood vessels may compensate to a certain point for the loss of the myocardial force, and for a loss of blood volume. But when the muscle fibers in the wall of the blood vessels are also injured, the muscle becoming flaccid only contributes to a further lowering of the blood pressure. Perhaps the greatest factor in the maintenance of blood pressure is peripheral resistance. It is equally important in the production of hypotension. Arterioles and capillaries, by means of the vasomotor center working in conjunction with the endocrine system, are held in a state of tonic contractions as the vasomotor impulses travel to and fro from the blood vessels. Any agent, thus disturbing the function of the muscles of the blood vessels, the nervous system innervating them, or the endocrine glands stimulating or inhibiting the vasomotor nervous system, may alter the state of the blood pressure. The last factor dealing with the change in the blood volume is particularly important in the production of some forms of acute hypotension. Although contraction of the blood vessels may compensate to a certain point for the loss in blood volume, it cannot meet the situation quickly and completely enough in severe trauma, hemorrhage, or shock to prevent dangerous hypotension. To administer appropriate treatment it is necessary, therefore, to examine as far as possible, in the light of our present knowledge, the various agents, toxic, physical, chemical, functional, et cetera, which either alone or in conjunction with others induce favorable conditions for the production of hypotension.

Temporary or acute hypotension simulates fainting. It follows most frequently an anaphylactic, traumatic or surgical shock. Sometimes a profuse hemorrhage with or without shock plays a very important rôle.

Heidenhain,²² quoted by Friedlander, injecting peptone into the blood stream, produced persistent hypotension with marked concentration of the blood. Pearce and Eisenbrey,²³ having confirmed the findings with peptone injections, concluded, from their experimental work on dogs, that anaphylactic shock resembled in many ways surgical shock and that anaphylactic shock and peptone intoxication in their reactions appeared identical. With the introduction of venous therapy, physicians have observed similar phenomena, sometimes following a most innocuous venous injection, which

doubtless must have contained a foreign protein. Anaphylactic shock is said to follow a partial or complete vasomotor paralysis, caused by splanchnic congestion and a subsequent disturbance of the blood volume.

Shock due to trauma received the most studious examination during the late World War by highly trained observers of France, England and America. Their studies showed first that neither injury to the heart muscle nor an exhaustion of the vasomotor center was the primary cause of the low blood pressure. Next, they demonstrated by clinical observations and laboratory experiments that a toxic factor increased permeability of the capillary walls and a consequent reduction of blood volume by the escape of plasma into the tissues. Cannon²⁴ adds that after sufficient time has elapsed infection may occur and thus produce persistent low blood pressure, and explains further that there is "no essential difference between the effects of toxins given off by damaged tissue and of toxins resulting from the activity of the bacteria." Experiments of Dale and Laidlaw²⁵ and Dale and Richards²⁶ with the injection of minute amounts of histamin into animals produced phenomena greatly resembling hypotension in traumatic shock. They concluded that the action of histamin may be reasonably regarded as typifying the action of a large class of protein derivatives—products of partial digestion, of bacterial action and of tissue extraction. Clinical observations on the one hand show that secondary shock does not appear immediately after trauma, and comes also too early for the appearance of a well established infection, hence it can be neither nervous nor bacterial in origin. On the other hand it has been observed most frequently with extensive laceration of the muscles. Moreover, measures favoring absorption, as poor drainage from deeply seated muscle wounds, increase shock, while a check of absorption as by a tourniquet above the wound decreases shock. In addition to the histamin or histamin-like toxic agents, hemorrhage, cold, exposure, and anesthesia may aid also in the production of marked hypotension.

Surgical shock may likewise be divided into primary and secondary shock. Occasionally, a patient possessed with great fear succumbs to primary surgical shock but usually death follows secondary shock. Factors favoring surgical shock are hemorrhage, toxic agents from infection, loss of body fluids from various causes, chilling of the body, tissue trauma, rough handling of the abdominal viscera, and the anesthetic itself. There may be an interplay of several causative factors, but generally it is held that in surgical shock the arterioles are contracted tightly, that the heart contracts strongly and is ordinarily capable of raising blood pressure to a normal level and that the real cause of the low blood pressure is due to the decreased volume of blood in circulation. Accordingly, some observers classify shock as mild, moderate or severe, by the determination of the plasma volume which has left the blood vessels for the tissues. It is apparent, then, that hypotension caused by trauma and surgery with or without anesthesia has one common factor, namely, the loss of blood circulating volume, hence the treatment must be

directed primarily to the supplementing of this shortage of blood volume.

Every effort and measure, of course, ought to be instituted to prevent shock. Primary shock of nervous origin, although infrequent, should be treated without delay by rest, quiet, and nerve sedatives. Blood pressure should not be permitted to drop to a critical level by preventable delay or unnecessary procrastination. Secondary shock, however, demands swift and effective administration of concentrated solutions of glucose, sodium chloride, or gum acacia intravenously if death is to be avoided. Where hemorrhage persists, no measure should be left untried to stop it. Repeated blood transfusions, where concentrated saline and glucose solutions have failed, may save some lives. Application of heat, inhalation of oxygen, and cautious administration of drugs are also considered valuable therapeutic adjuncts.

The second large group of low blood pressure cases is found in the acute infectious diseases. Pyrexia and toxemia, playing the most important part in the production of hypotension, weaken the heart muscle, reduce the tone of the muscles in the blood vessels, and cause disturbances in the peripheral as well as central nervous system. To a certain degree the affections of the heart, blood vessels and nervous systems depend also on the type of infection and the condition of the patient prior to the infection. Some of the most frequent infectious diseases causing hypotension are: typhoid fever, pneumonia, influenza, diphtheria, scarlet fever, cholera, malaria, epidemic cerebrospinal meningitis, typhus fever, and trichinosis. In the advanced stages certain chronic diseases, like tuberculosis, syphilis, diabetes, bronchial asthma, and food deficiency may be likewise very disturbing. Sometimes long-standing focal infections, anemia, cachexia, or a debilitating disorder may cause hypotension.

The treatment of hypotension associated with or following on the heels of an infectious disease, consists largely in ridding the patient of the disease. Wherever possible, specific drugs or sera should be employed. In most cases supportive and symptomatic treatment usually suffices, and after the disease has been terminated for some time hypotension disappears. Some cases, however, retain hypotension either for a long time or permanently and may or may not require a restriction of their activities.

The third group of hypotension results from cardiac weakness or failure. This may come on rather gradually like in valvular disease or suddenly as in coronary thrombosis. Valvular disease as a long-standing mitral stenosis or severe hypertension may, in time, wear down the myocardium and produce secondary hypotension. A large aortic aneurysm without aortic insufficiency not infrequently produces hypotension. Some of the long and frequently recurring paroxysmal tachycardias and bradycardias associated with Stokes-Adams syndrome show either temporary or permanent hypotension. Obesity and long-standing focal infections and toxic states like diabetic coma often produce myocardial weakness with secondary hypotension.

Since hypotension in this group, like in the preceding

two, is relative and is produced entirely by weakness or inadequacy of the propelling force, the treatment must be directed primarily to the strengthening of the myocardium. Rest, digitalis, mild physiotherapy, massage, sun baths, sedatives, and an appropriate diet for individual needs constitute the most commonly employed therapeutic procedures for myocardial weakness. Coronary thrombosis and toxic or infectious myocarditis, each call for its specific line of treatment.

The fourth group causing hypotension is vague and indefinite. It depends on the disorders or disturbances of some of the endocrine glands, among which the best known conditions are Addison's disease, hypopituitarism and hypothyroidism. The hypoadrenalemia, hypoglycemia, and lowered basal metabolism of Addison's disease sometimes cause not only hypotension but also all the symptoms of a mild shock. Friedlander¹¹ calls attention to certain constitutional diatheses commonly associated with cardiovascular, nervous, muscular and glandular hypoplasia or dysfunction. He mentions particularly status lymphaticus, infantilism, myasthenia gravis, and adiposis dolorosa. Body habitus, exposure to high temperature and variations in atmospheric pressure have also a tendency to produce hypotension.

In this group of hypotension the treatment will vary as the agent varies which produces a certain disease, a functional disturbance, or an anatomic abnormality. While Addison's disease may be treated principally with cortin, and hypothyroidism with thyroid extract, some of the less understood conditions naturally will receive treatment which primarily improves health and retards disease and secondarily acts favorably on hypotension.

The fifth, not large but very interesting, group comprises postural or orthostatic hypotension, which results from the abnormal gravitation of blood when the subject is in the erect position. Normally, a change of the body from the supine to the erect position throws an extra strain on the circulation and the organism physiologically adjusts itself by increasing the pulse rate and raising the diastolic while lowering the systolic blood pressure. But in 1925, Eggleston and Bradbury¹⁰ discovered three cases of hypotension which failed to conform to this physiological concept. They suffered from syncopal attacks after or during exertion and sometimes even after standing erect for some minutes. The pulse remained slow and the rate unchanged, the basal metabolism was lowered, perspiration was lacking, and the patients were worse during the summer. The first case in this series is quoted because it shows the unusual blood pressure readings and the accompanying clinical findings quite characteristic of the whole group.

The patient was a male, thirty-eight years old, suffering from "terrible weakness," constant headaches, nocturia, and spots before the eyes. In the lying position the blood pressure read systolic 110, diastolic 65; on standing it fell to systolic 80, diastolic 40 mm. of mercury. After slight exercise there was no dyspnea nor any increase in pulse rate, but in one minute the head fell back, the pupils dilated, slight convulsive movements appeared and, with increased pallor, unconsciousness and loss of radial pulse followed. Then after five

minutes in the reclining position the blood pressure rose to 60 systolic, 40 diastolic mm. of mercury and recovery took place. Blood pressure readings taken on several occasions always showed the lowest values in the standing, slightly higher in the sitting and the highest in the lying position. Having designated these cases as postural hypotension the authors studied the effects of epinephrin, atropin, and pilocarpin, in the lying, sitting, and standing positions, and from the clinical observations and laboratory studies concluded that only a paralysis of the sympathetic vasoconstrictor endings seemed to explain adequately the blood pressure reactions in their cases.

In 1927, Bradbury and Eggleston⁸ reported that two of their patients had died, rather suddenly. The anatomical diagnosis on one of the cases at postmortem was: chronic myocarditis, acute dilatation of the heart, atrophy of the prostate gland, and chronic tuberculosis of the bronchial lymph nodes. As postural hypotension became recognized as a clinical entity, case reports appeared in various sections of the country. Bar and Duggan⁹ reported postural hypotension in a negro suffering with Addison's disease. Sanders¹⁰ observed it with chronic diarrhea and tachycardia. After reviewing the literature, Barker⁴ recorded a case with numerous laboratory studies. Laubry and Dourne¹¹ introduced the term "orthostatic" hypotension. Weis¹² reported a cure of a case with ephedrine sulphate. Reporting a case with unusual features, Alvarez³ states that most cases show:

- "1. Sharp drop in systolic and diastolic pressure with syncope when they stand.
- "2. Failure of pulse rate to increase so as to compensate for drop in pressure.
- "3. Deficient sweating and inability to stand hot weather.
- "4. Secrete large volumes of urine at night.
- "5. Additional features frequently, such as appearance of youthfulness, lowering of basal metabolism, signs of slight changes in the nervous system, loss of sexual desire, and concentration of blood urea around the upper limit of normal."

Ghrist and Brown¹³ contend that the splanchnic vessels lack resistance, and the vagal cardiac regulatory mechanism is deficient in failing to increase the heart rate to compensate for the alterations in blood pressure. Others following the hypothesis of MacWilliam¹⁴ assign the disturbing agent to the lower extremities. Doubtless the vasomotor system plays the principal part in the production of postural hypotension, but as long as the physiological processes remain unknown or only partially worked out, theories regarding the cause will be constantly increasing.

In treating orthostatic hypotension every effort should be exerted to maintain blood pressure above the level which produces undesirable symptoms when the patient is erect. Among the drugs found most useful in the treatment of postural hypotension were ephedrine sulphate, benzedrine sulphate, ergotamine tartrate and paredrine hydrobromide. Ghrist and Browne¹³ reported

a cure with ephedrine sulphate. Horton and Brown,¹⁴ after experimenting with various medications, combined ephedrine sulphate with paredrine hydrobromide and thus obtained the most satisfactory results. When postural hypotension is better understood, unquestionably the treatment will be also more efficacious.

The sixth group embraces essential hypotension, a syndrome whose chief objective finding is marked hypotension. Among the symptoms listed are exhaustion, nervousness, headaches, pains in the chest, abdomen or extremities, indigestion, constipation, backache, dyspnea, insomnia and palpitation. Not infrequently such patients are diagnosed as neurasthenics, psychasthenics or psychoneurotics. They are individuals usually between the ages of twenty and forty and the condition is at least twice as common in women as in men. There is a lack of the usual stamina necessary to meet the daily routine of life. Among the theories advanced to explain essential hypotension are an asthenic type of individual, status lymphaticus, autointoxication, decreased oxidation, constitutional inferiority, preceded possibly with endocrine disturbances or post-infectious exhaustions or toxemias, storage of excessive quantities of blood in the splanchnic vessels, and capillary stasis due to histamin or histamin-like bodies. Although medical writers disagree on the theory of causation, they all agree that the individuals lack necessary endurance, mental, physical and emotional. As long as they are sheltered and, either by accident, circumstance or design, prevented from unusual strain and stress of modern civilization, their limited constitutional capacity operates smoothly and satisfactorily. When ambition stimulates them to compete with the robust type, or occupational worries, familial disturbances, domestic wrangles, or financial reverses place an additional strain on the constitution, a marked depreciation in health results.

In the treatment of essential hypotension it is necessary to recognize the subnormal physical, mental and emotional strength of the individual in order to regulate his activities, choose an occupation, select a diet, insist on rest and prescribe drugs to maintain or increase his vigor instead of employing measures which might tear down or destroy it. Such treatment is always difficult and painstaking. Essential hypotension found in the fairly robust type resulting from overwork or some acute infection, responds to treatment more readily than the former.

Comment

Hypotension in the light of our present knowledge might be regarded as a symptom of some known or unknown causes, sometimes predictable and many times unpredictable. Clinical, laboratory, and experimental evidence favor a theory of multiple and sundry causes rather than one and unique for the production of hypotension. Whether the constant accumulation of knowledge may unearth one single initiating, directing or guiding link in the long chain of causes held today, remains a moot question for the future. Any classification of hypotension in recent years is unsatisfactory because frequently cases in one group overlap with

another when they manifest similar or identical characteristics. And to complicate the picture still further, many of the symptoms and findings attributed to hypotension are observed in perfectly normal individuals or even sometimes in cases of hypertension. It is safe to say, however, that the disturbance or failure of two factors—the heart or driving force and the vasomotor controls—account for hypotension in the majority of cases. Other factors, like hemorrhage or loss of body fluids, are of relatively rare occurrence and from the numerical standpoint negligible. Endocrine dysfunction, toxemias (endogenous or exogenous) and infections with their toxins are important in the production of hypotension only in so far as they depress cardiac or vasomotor action and when compensatory functional mechanisms, such as increased pulse rate, or rising blood pressure, do not appear. In recent years, operations performed on the sympathetic nervous system, such as bilateral ramisection, ganglionectomy, bilateral vascular sympathetic neurectomy for hypertension and vascular crises, as Raynaud's disease or erythromelalgia, have given not only satisfactory results but have proven also that blood pressure is actually controlled by the sympathetic nervous system. It is apparent, then, that the most important single factor in the production of hypotension is a disturbed vasomotor control.

Conclusions

1. Hypotension is a symptom.
2. For practical purposes, especially for treatment, six groups are proposed on a more or less recognized etiological basis. These are:
 - a. Hypotension due to shock (trauma, surgery, anesthesia) causing peripheral nerve-paralysis and treated largely by introduction of concentrated solutions intravenously.
 - b. Hypotension in acute infectious diseases caused by toxins acting upon the whole organism but especially on the myocardium and treated by supportive therapy.
 - c. Hypotension resulting from myocardial insufficiency due to long-standing causes, like valvular disease or hypertension, and treated by supporting the myocardium.
 - d. Hypotension encountered in endocrine dysfunction or constitutional diatheses and treated by specific or pluri-glandular replacement therapy.
 - e. Hypotension (orthostatic) discovered only recently and resulting from abnormal gravitation of blood when the subject is in the erect position and treated best by large doses of ephedrin sulphate and paredrine hydrobromide.
 - f. Hypotension (essential) found in relatively well individuals, frequently without any complaints due to constitutional deficiencies and either not treated or treated only symptomatically.

3. An analysis of 627 cases of hypotension in the first examination at the office in regard to presenting complaints, family history, age, sex, tuberculosis, social

state, operations, past history, infectious diseases, occupation and final diagnosis indicates that modern stress and strain in undermining the vegetative nervous system plays a major part in the production of hypotension.

References

1. Alvarez, W. C.: Blood pressure in fifteen thousand freshmen. *Arch. Int. Med.* 32:17, 1923.
2. Alvarez, W. C.: Orthostatic hypotension. Report of a case with some unusual features. Staff Meeting of Mayo Clinic, 10:483, July 31, 1935.
3. Bar, David P., and Duggan, LeRoy B.: Postural hypotension in a negro with Addison's disease. *Endocrinol.* 15:531, 1931.
4. Barker, N. W.: Postural hypotension. Report of a case and review of literature. *Med. Clin. No. Am.*, 16:1301, May 1933.
5. Bradbury, Samuel, and Eggleston, Cary: Postural hypotension, an autopsy upon a case. *Am. Heart Jour.*, 3:105, Oct., 1927.
6. Cadbury, W. W.: Blood pressure of normal Cantonese students. *Arch. Int. Med.* 30:362, 1922.
7. Cannon, W. B.: Traumatic shock. Appleton, New York: p. 164, 1923.
8. Dale, H. H., and Laidlaw, P. P.: Histamine shock. *Jour. Physiol.*, 52:355, 1918.
9. Dale, H. H., and Richards, A. N.: Vasodilator action of histamine. *Jour. Physiol.*, 52:110, 1918.
10. Eggleston, Cary, and Bradbury, Samuel: Postural hypotension. *Am. Heart Jour.*, 1:73, 1925.
11. Friedlander, Alfred: Hypotension, *Medicine*, 6:143, 1927.
12. Ghrist, W. G., and Brown, G. E.: Postural hypotension with syncope: its successful treatment with ephedrin. *Am. Jour. Med. Sci.*, 175:336, (March) 1928.
13. Heidenhain, R.: *Arch. f. d. ges. Physiol.*, 49:252, 1891, quoted from Friedlander.¹¹
14. Horton, Bayard T., and Browne, Harry C.: Postural Hypotension. Hourly and daily blood pressure variations. *Minn. Med.*, 22:303, (May) 1939.
15. Janeway, T. C.: Clinical studies of blood pressure, New York, 1904.
16. Kilborn, L. G.: Blood pressure of Szechwanese students. *China Med. Jour.*, 40:1, 1926.
17. Laubry, C., and Dourne, E.: Orthostatic hypotension. *Presse Medicale*, 40:17, 1932.
18. MacWilliam, J. A.: Postural effects on heart rate and blood pressure. *Quart. Jour. Exp. Physiol.*, 23:1, 1933.
19. Oliver, G.: Studies in blood pressure, London, Halliburton, 1916.
20. Pearce, R. M., and Eisenbrey, A. B.: A study of the action of the heart in anaphylactic shock in the dog. *Jour. Pharm. and Exper. Therapy*, 4:21, 1912.
21. Roberts, D. M.: Hypotension or low blood pressure. *Am. Med. Jour.*, 71:448, 1937.
22. Sanders, Audley O.: Postural hypotension. Case Report. *Am. Jour. Med. Sci.*, 182:217, 1931.
23. Sanders, Audley O.: Postural hypotension with tachycardia. *Am. Heart Jour.*, 7:808, 1931, 1932.
24. Taylor, F. R.: Hypotension. *Oxford Medicine*, 2:338.
25. Weis, Clifford R.: Postural hypotension with syncope. Report on a case with ephedrin sulphate. *Ann. Int. Med.*, 8:35, 1934.

Discussion

DR. ALBERT SNELL, Rochester: Dr. Lepak has mentioned the importance of blood volume in the maintenance of normal arterial tension. This fact is well exemplified by the course of patients who have Addison's disease. During periods of crisis, the blood pressure falls to extremely low levels, chiefly owing to hemoconcentration and a decrease in blood volume. Administration of the synthetic cortical hormone, desoxycorticosterone acetate, produces retention of salt and water and, if used in a dosage larger than necessary, there may be a sufficient increase in blood volume to produce actual hypertension. In fact, cardiac dilatation and acute cardiac failure may be induced by this means in cases in which Addison's disease is present. The relation of blood volume to blood pressure has not been extensively studied in all types of hypotension, but, certainly, the importance of normal blood volume in this group of patients may well be greater than was formerly believed.

LYMPHOSARCOMA OF THE STOMACH AND BOWEL*

Report of Two Cases

JAMES A. JOHNSON, M.D.

Minneapolis

Lymphosarcoma of the gastrointestinal tract is a relatively uncommon disease. In 1932, Ullman and Abeshouse¹ reported that there were 375 cases of the small and large intestine. In March, 1939, Madding² reported that there were 428 cases up to 1938 of all types of sarcomas of the stomach and collected sixty-seven additional cases from the Mayo Clinic, 81 per cent of them classed as lymphosarcomas. Collins³ states that sarcomata comprise about 1 per cent of all neoplasms of the stomach. In comparison with the stomach and colon the small intestine is relatively free from malignancy. Lymphosarcoma, however, is probably found as frequently as any other form of malignancy in this locality. This is especially true in the ileum.

Statistics are undoubtedly quite unreliable because of the confusion which arises as to its terminology. Ewing⁴ has given a most comprehensive discussion of this subject in the February, 1939, Bulletin of the New York Academy of Medicine. Any one who desires detailed information should read his article. Lymphosarcoma is often reported as sarcoma of either the large or small cell variety. It is often mentioned as intestinal Hodgkin's disease, malignant lymphocytoma or lymphoblastoma. These distinctions are probably only of academic value, at least as far as the clinician is concerned. It has, therefore, often been suggested that the general term of lymphoblastoma be used to obviate the confusion.

The etiology of lymphosarcoma is as obscure as it is in all other malignant diseases. Trauma has often been mentioned in individual reported cases, but it is usually difficult to establish any definite relationship. Ewing states that subacute bacterial infection stands as one of the common excitants of lymphatic tumors. There is perhaps some irritant present that incites cell growth, but the cause awaits further development, as is the case in all malignancy.

Lymphosarcoma of the gastrointestinal tract is most common in the first, third and fourth decades of life, the average age being about forty years. The average age in Ullman's series of intestinal cases was 33.19 years, males showing a preponderance of 5 to 2. It is most frequent in the white race. The average age of gastric cases reported by Madding was forty-six years. Males were affected in a proportion of 6 to 1.

Lymphosarcoma in the stomach and intestine appears either as an annular or polypoid growth. The annular or infiltrating type is more common. It begins in the lymphoid tissue of the submucosa and spreads laterally into the muscular layers, which it gradually replaces with a hard infiltrating growth. The growth appears as a subserous tumor which usually does not penetrate through the serosa but often invades the mucosa and causes ulceration. The tumor is of a firm

consistency and often has an irregular contour. In the stomach it may resemble diffuse carcinoma, the so-called "linitis plastica." It spreads by direct extension into the adjacent lymph nodes and later to distant organs either by lymphatic or blood channels. It occasionally perforates. Lewis⁵ found only six instances of perforation out of 400 reported cases.

The diagnosis is rarely made before operation. There are no classical signs or symptoms by which it can be recognized. The symptoms are usually of an obscure nature and consist of an indefinite gastric or abdominal distress, depending largely upon ulceration of the mucosa or obstruction to the lumen for their localization. A secondary anemia together with moderate leukocytosis is usually present. Roentgen examination is the greatest aid to diagnosis. The gastric rugae are decidedly enlarged, suggesting a marked submucosal infiltration, much resembling an advanced hypertrophic gastritis. The general picture is that of a gastrointestinal malignancy and that is the usual preoperative diagnosis.

Treatment consists of surgery and x-ray therapy. It represents much the same problems as any other malignancy. Lymphosarcoma, unfortunately, does not produce as early obstruction and ulceration in the gastrointestinal tract as does carcinoma, and is, therefore, usually more advanced. It metastasizes early and widely into the surrounding glands and the result is, therefore, less favorable. If the lesion can be recognized early enough to permit a thorough removal, the eventual result will no doubt compare favorably with other malignancies.

Case Report

Case 1.—Mrs. L. B., aged fifty-six, housewife, came to the office on August 8, 1939, referred by her family physician, Dr. F. R. Huxley.

Past history: She had had typhoid fever during childhood. During the past ten years there had been recurrent attacks of abdominal pain of short duration.

Present illness: During March, 1939, she had an attack of influenza and since then had not been well. She began to notice epigastric distress after meals which had gradually increased until at the time of her examination it was very severe and she often vomited before there was any relief. Recently, the stools had been loose, often three to five stools daily. There had been a weight loss of 15 pounds the past five months.

Physical examination: Revealed considerable loss of weight with pallor. A hard mass could easily be palpated in the epigastrium. The abdomen was slightly distended. The heart and lungs were normal; blood pressure was 100 systolic, 70 diastolic.

Laboratory findings: Urine negative; hemoglobin 55 per cent; red blood cells 3,700,000; leukocytes 13,200 with 81 per cent polymorphonuclears; Kolmer and Kline negative. No gastric contents were examined because of her fear of this procedure.

X-ray examination: Revealed a large lesion of the stomach involving two-thirds of the pyloric end with 25 per cent retention at the end of six hours. The diagnosis was advanced carcinoma of the stomach, probably operable.

Operation (August 20, 1939): General anesthesia. On opening the abdomen there was found a large growth involving almost the entire stomach. The adjacent glands on the lesser and greater curvature were extensively involved. There were several enlarged glands

*From the Department of Surgery, The Nicollet Clinic, Minneapolis, Minnesota.

in the mesentery of the small bowel. The liver and remainder of the abdomen were free. I decided to remove the growth so that she could eat in comparative comfort as long as she lived. An extensive removal was done, leaving only a small pouch to which the jejunum was anastomosed by the Polya method. An entero-anastomosis between the two arms of the jejunum was then made. Five hundred cubic centimeters of blood and 1000 c.c. of 5 per cent glucose in normal saline were given intravenously during the operation.

Post-operative condition: Uneventful until the third day, when she developed a generalized edema. This was probably a salt retention edema enhanced by her anemia. There was also a circulatory factor. She was given several intravenous injections of 10 per cent glucose in distilled water together with a blood transfusion and digitalis. The edema had disappeared in four days and the remainder of her convalescence was normal.

Pathological report: Gross: There is a massive tumor involving about two-thirds of the mucosa of the resected portion of the stomach. This tumor is thrown up into enormous folds which roughly resemble normal gastric rugae. There is ulceration at several points. The wall is about 1.5 cm. in thickness and the muscular layer is visible at the base of the tumor. The peritoneum is heavily infiltrated with large thick plaques. In the attached mesentery there are soft yellow white lymph nodes ranging up to 1.5 cm. in diameter.

Microscopic sections: Show a massive infiltration by small round cells, endothelial cells, eosinophiles and polymorphonuclears. This is present both in the gastric tumor and the lymph nodes. Because of the variation in the size and form of the cells, leukemic infiltration is improbable and by exclusion the diagnosis of lymphosarcoma or Hodgkin's is made.

The picture corresponds to the condition previously classified as lymphosarcoma.

Result: She returned to her home on September 24 with instructions to come back after a short convalescence for x-ray treatments. About three weeks later her family physician, Dr. Huxley, telephoned that she had become deeply jaundiced. She died on November 1, apparently from a rapid extension of the growth.

Comment: During the operation it was found that there was massive infiltration about the head of the pancreas and bile ducts. The tumor growth evidently progressed rapidly and caused an obstructive jaundice.

Case 2.—Mr. H. M., aged sixty-seven, a retired farmer, came to the office August 22, 1939, referred by his family physician, Dr. A. W. Sommer.

Past history: Typhoid fever at the age of twenty, appendectomy at twenty-two. Gastric distress eighteen years ago relieved by diet and medication. Otherwise general health had been good.

Present illness: During the past five months he had noticed epigastric distress with some distention. The past two months pain had localized in the left upper abdomen and was most severe directly after eating. There had been some nausea but no vomiting. He had lost twenty pounds the past five months. One week previous to my seeing him he first noticed a lump in his left upper abdomen.

Physical examination: A poorly nourished man with a hard irregular mass the size of a fist in the left upper abdomen. The mass was freely movable from side to side. The spleen could be felt separately and was not involved in the tumor. Lungs and heart were normal; blood pressure 124 systolic, 70 diastolic.

Laboratory findings: Urine and Wassermann negative; hemoglobin 59 per cent, red blood cells 4,560,000

—deformed cells; leukocytes 13,800, differential white cells normal.

X-ray examination: The stomach and colon were normal. The mass was located in the jejunum. There was partial obstruction and some barium was retained in the tumor. A diagnosis of jejunal tumor was made and operation advised.



Fig. 1. (above) Lymphosarcoma of stomach, showing diffuse infiltration of the wall together with extensive involvement of the mucosa with ulceration.

Fig. 2. (below) Specimen of jejunum with wall and lymphatic glands extensively involved.

Operation (August 25, 1939): Left upper rectus incision. A large diffuse infiltrating tumor was present in the upper jejunum. About 30 inches of the bowel and mesentery were extensively involved with an infiltrating growth. The infiltration extended to the base of the mesentery and beyond. There was no evidence of distal metastasis. The entire growth including a wide area above and below was excised. The mesentery was removed down to its junction with the posterior wall. The growth extended beyond this point behind the peritoneum and could not be completely excised. The growth was high on the jejunum and there was just room enough for a side-to-side anastomosis. He was given a 500 c.c. blood transfusion following the operation.

Post-operative: Except for a slight cold his recovery was normal. He left the hospital on the eighteenth day to return later for x-ray treatment.

Pathological report: Gross: The specimen consists of a long segment of bowel and its mesentery. The bowel wall at several points is over 1 cm. in thickness. The entire segment is infiltrated by a grey diffuse tumor which is located principally in the peritoneal and muscle layers. At numerous points the mucosa is also

involved and a few of these areas are ulcerated. The mesentery is involved by masses of grey lymph nodes which are fused together, producing shortening of the mesentery and adhesions of the bowel loops. The mesenteric mass at one point is about 4 inches in diameter.

Microscopic sections: Sections of the bowel and nodes show that they are completely destroyed by a growth of round lymphoid cells. Mixed with these are larger endothelial-like cells together with leukocytes, both polymorphonuclears and eosinophiles.

Diagnosis: Lymphoblastoma of the bowel and mesentery. The term lymphoblastoma is a general one applied to this group of diseases. The term lymphosarcoma is the one in most common usage.

Result: On October 24, 1939, he returned for deep x-ray therapy. He stated that he was feeling fairly well and had no pain or distress. He was able to take a general diet and gained a little weight. The secondary anemia showed improvement.

Comment: The growth had extended deep into the retroperitoneal glands, which could not be removed. His relief, therefore, will only be symptomatic and will depend on the rapidity or slowness of growth of the remaining tumor.

Conclusions

1. Lymphosarcoma of the stomach and bowel is a comparatively rare disease. It occurs often enough, however, so that the surgeon should be constantly on guard and not fail to recognize its presence. It is with this in mind that I have reported in detail these two cases.
2. The etiology is unknown.
3. It begins as a local disease in the lymphoid tissue of the submucosa and spreads to infiltrate all the layers.
4. The treatment is the same as that of any malignant neoplasm.

Bibliography

1. Collins, E. N., and Carmody, M. G.: Lymphosarcoma of the stomach, a study of four cases. *Am. Jour. Digest. Dis. and Nutri.*, 3:884, 1936.
2. Ewing, James: General pathology of lymphosarcoma. *Bull. New York Academy of Med.*, p. 92, (Feb.) 1939.
3. Lewis, D. L.: Two cases of sarcoma of the small intestine with unusual features. *Brit. Jour. Surg.*, 26:540, 1938.
4. Madding, G. F.: Lymphosarcoma of the stomach with particular reference to the reticulum cell variety. *Proc. Mayo Clinic Staff Meetings*, March 29, 1939.
5. Ullman, A., and Abeshouse, B. S.: Lymphosarcoma of the small and large intestines. *Ann. Surg.*, 95:878, 1932.

Discussion

DR. ALFRED HOFF, Saint Paul: It may be of interest to cite a case I first saw in 1932 and followed for seven years until her death in 1939. This patient, fifty-seven years old when first seen, complained of pain in the left side of her abdomen. X-ray studies after a barium enema revealed a constant filling defect in the cecum. Malignancy was considered probable and a cecal resection was done by Dr. A. R. Colvin. The tumor found in the cecum had a convolutions-of-the-brain appearance and the microscopic diagnosis was lymphosarcoma.

Three years later this patient developed a chyloid effusion and an indefinite nodular mass appeared in the abdomen. About this same time palpable discrete lymph glands were found in the groin and axilla. The spleen and liver were not palpable.

From this time until her death four years later she was rarely confined to bed, although dyspnea on moderate exertion became increasingly evident.

During all of this time repeated blood examinations, except for a moderate anemia and leukocytosis with a neutrophilia, were not significant.

No x-ray therapy was attempted.

A complete blood study made on the day preceding her death failed to show any signs of immaturity or changes indicating the leukemia which was found at autopsy.

DR. A. R. COLVIN, Saint Paul: The case reported by Dr. Hoff, in connection with Dr. Johnson's case reports, presented some points not referred to by Dr. Hoff. The patient had complained for years of abdominal pain and in the course of Dr. Hoff's examination he discovered with radiography a fairly large stone in the left kidney. Pyelogram revealed a marked dilatation of the calices with retention of the contrast medium for several days. I may say that the kidney condition was ignored for the time-being because of the presence of a palpable tumor in the cecal region; radiography revealed a filling defect in the cecum. Operation was undertaken because of the possibility of carcinoma of the cecum. At the operative exposure it was remarked that the tumor did not have the feel of what we are accustomed to find in carcinoma of the large bowel, but felt like a diffuse uniform enlargement extending well up into the ascending colon. On removal of the colon well on into the transverse, the mucous membrane was uniformly thickened and presented a wavy appearance. There was no glandular enlargement. Strange to say, she had no more pain after recovering from the operation, although the stone in the kidney was not disturbed and she had a marked hydronephrosis. The stone and hydronephrosis was found also at autopsy. Dr. Hoff has told you she lived six years. Her death was due, as Dr. Hoff has told you, to a generalized pseudo-leukemia. Preceding her operation, she had remarkably few gastrointestinal symptoms.

I suppose the question might be raised whether a condition such as was found in her colon required surgery. It is possible that she might have lived just as long without operation, but perhaps in a similar case one would again be uncertain as to the condition found at exploration in the absence of glandular enlargement, as in the case reported.

Dr. Johnson's cases are reported as lymphosarcoma. The large group of conditions including pseudo-leukemia, lymphosarcoma, Hodgkin's disease and lymphomatosis are at times very difficult of differentiation clinically and perhaps this is true histologically.

The next case was perhaps even more confusing. A woman of fifty-four complained of persistent nausea and occasional vomiting, in the presence of tachycardia, a basal metabolic rate of plus 40, and a fairly marked bilateral enlargement of her thyroid gland. Hyperthyroidism was a probability and still the clinical picture was lacking in some of the elements of hyperthyroidism. The patient did not look like a toxic goiter complex. Radiographic study of the stomach was negative.

The thyroid enlargements felt much firmer than any of the usual enlargements. Riedel's granuloma was thought of but, at operation, on incising the gland it lacked the tough fibrous condition found in Riedel's granuloma. The cut surface resembled that of a firm sarcoma. Subtotal removal was done, and, although immediate recovery was satisfactory, the patient died in about three months. At autopsy, a pseudo-leukemic infiltration of the submucosa of the entire stomach was found, the mucous membrane being thrown into coarse wavy folds very much like that seen in the colon of the other case. There was a firm nodule about the size of a large bean in the wall of the small intestine, and a similar one in the wall of the left ventricle; there was quite an amount of milky fluid in the peritoneal cavity.

BOOK REVIEWS

Here, then, we have a generalized disease presenting local lesions confusing as to interpretation. The disease is a generalized one and always fatal. The increased basal metabolic rate is perhaps always present and should call attention to a condition in which surgery is only temporarily helpful.

Dr. HERBERT JONES, Minneapolis: I would like to ask Dr. Johnson what the effect of the x-ray was on this growth?

Dr. JOHNSON: It is only about six weeks since he completed the x-ray treatments and not enough time has passed to notice any changes. I believe it is quite generally recognized that x-ray treatments of this type of tumor are often followed by favorable results for a considerable period of time.

Dr. J. A. LEPAK, Saint Paul: I had a case with this condition and the operation was performed by Dr. Arnold Schwyzer. He opened the abdomen, recognized the condition by its gross pathology, and simply closed it. The case then received x-ray treatment and has been perfectly well for three years.

The meeting adjourned.

A. G. SCHULZE, M.D.
Secretary

The Negro and the City

Cities are relatively much more destructive to Negroes than to whites in their effects on mortality from tuberculosis and acute respiratory infections. Under present conditions mortality from respiratory diseases acts as a powerful check to the natural increase of the Negro in northern latitudes. Holmes, S. J., Amer. Jour. Med. Science, 1938, 195.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

INTRODUCTION TO GASTRO-ENTEROLOGY. Third Edition of The Mechanics of the Digestive Tract. Walter C. Alvarez, Professor of Medicine, University of Minnesota, the Mayo Foundation, and Senior Consultant in the Division of Medicine, Mayo Clinic. 778 pages. Illus. Price, \$10.00, cloth. New York: Paul B. Hoeber, 1940.

CANCER OF THE BREAST AND CANCER OF THE UTERUS. Second Edition. Marion Ellsworth Anderson, A.B., M.D. 106 pages. Illus. Price, \$3.50, cloth. Clinton, Iowa: Franklin Press, 1939.

POPULATION, RACE AND EUGENICS. Morris Siegel, M.D. 206 pages. Price, \$3.00, cloth. Hamilton, Canada: Dr. Morris Siegel, 1939.

LANE MEDICAL LECTURES: VIRUSES AND VIRUS DISEASES. Thomas M. Rivers, M.D., Sc.D., Director Hospital of the Rockefeller Institute for Medical Research, New York City. 133 pages. Illus. Price, \$2.50, cloth. Stanford University, California: Stanford University Press, 1939.

MANUAL OF FRACTURES, DISLOCATIONS AND EPIPHYSEAL SEPARATIONS. Harry C. W. S. de Brun, M.D., F.A.C.S., Adjunct Professor of Surgery, New York

SILVER PICRATE

Wyeth

**Has shown a CONVINCING RECORD* OF
EFFECTIVENESS in ACUTE ANTERIOR URETHRITIS**

**due to *Neisseria gonorrhoeae* • *Trichomonas vaginalis*
*Monilia albicans***

Silver Picrate is a crystalline compound of silver in definite chemical combination with picric acid. Dosage form for use in anterior urethritis: Wyeth's Silver Picrate Crystals in an aqueous solution of 0.5 percent.

Supplied at all pharmacies in vials of 2 grams

Complete literature on Silver Picrate as used in genitourinary and gynecological practice will be mailed on request.

*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

BOOK REVIEWS

- Polyclinic Medical School and Hospital; Associate Visiting Surgeon, Swedish Hospital, Brooklyn; Consulting Skeletal Surgeon, New York Police Department, etc. 468 pages. Illus. Price, \$3.00, cloth. Chicago: Year Book Publishers, 1940.
- MEDICAL EDUCATION IN THE UNITED STATES, 1934-1939. Council on Medical Education and Hospitals, American Medical Association. 259 pages. Paper cover. Chicago: American Medical Association, 1940.
- HANDBOOK OF ORTHOPÆDIC SURGERY. Alfred Rives Shands, Jr., B.A., M.D. Medical Director of the Nemours Foundation, Wilmington, Del.; Associate Professor of Surgery in Charge of Orthopædic Surgery, Duke University School of Medicine, Durham, N. C. 567 pages. Illus. Price, \$4.25, cloth. St. Louis: C. V. Mosby Co., 1940.
- THE PATIENT'S DILEMMA. The Quest for Medical Security in America. Hugh Cabot, M.D. 284 pages. Price, \$2.50, cloth. New York: Reynal & Hitchcock, 1940.
- DON'T EAT BREAD. Allen Klein, Ph.G. 116 pages. Price, \$1.00, cloth. Emmaus, Pa.: Rodale Press, 1939.

PRIMER OF ALLERGY. Warren T. Vaughan, M.D., Richmond, Va. 140 pages. Illus. Price \$1.50. St. Louis: C. V. Mosby Co., 1939.

This book is designed, one might say, as a companion volume to the "Practice of Allergy," which we reviewed earlier. The latter is a text designed for physicians. The "Primer" is designed to explain to laymen the concepts of allergy.

There are some sections on general instructions which should prove distinctly helpful. In general, however, it is my impression that the book attempts to be too complete, with the result that the average lay reader, when he has finished the first hundred pages, will feel almost as confused as when he started. For those patients interested in as complete an understanding as possible of our present knowledge of allergy the book will prove distinctly interesting.

On the whole one might wish a volume about one-half the length and about one-half the complexity. The few illustrations give one the idea that a volume making all its points with numerous pictures might be more effective than a volume indulging in considerable verbiage.

ASHER A. WHITE, M.D.

DISEASES OF THE CORONARY ARTERIES AND CARDIAC PAIN. Robert L. Levy, M.D. 445 pages. Illus. Price, \$6.00. New York: The Macmillan Co., 1936.

Unfortunately, this book was not presented for review when first published. However, a review at this time must not be considered as unsatisfactory because of the lapse of three years. In fact, the list of contributors is sufficient assurance of the value of the work as edited by Robert Levy. Men were selected who were outstanding in their fields to write the various chapters; for example, anatomy being described by Wearn, physiology by Wiggers, pharmacology by Fred Smith, and pathology by Von Glahn. Levy, Kerr, and Wilson contribute a discussion on the clinical data of coronary disease and its complications. The medical treatment is ably handled by Levy himself. There are also appended several interesting chapters on the sur-

gical treatment of diseases of the coronary arteries, including a contribution by James C. White on paravertebral alcohol injections and other measures for the relief of cardiac pain; Beck's surgical treatment for the development of a new blood supply to the heart; and a discussion by Blumgart on his results with total thyroidectomy for the relief of cardiac pain and congestive heart failure.

F. J. HIRSCHBOECK, M.D.

EYE, EAR, NOSE, AND THROAT MANUAL FOR NURSES. Roy H. Parkinson, M.D., F.A.C.S., oculist and aurist to St. Joseph's Hospital, San Francisco, Calif. Fourth edition. 243 pages. Illus. Price, \$2.25. St. Louis: C. V. Mosby Co., 1939.

This volume gives the subject matter briefly, yet with remarkable clearness and completeness. The material is arranged skillfully and the illustrations are well selected.

D. L. TILDERQUIST, M.D.

TUMORS OF THE HANDS AND FEET. Edited by George T. Pack, B.S., M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Yale University, School of Medicine and Cornell University, College of Medicine. Price \$3.00. 138 pages. St. Louis: C. V. Mosby Company.

This little volume is a reprint of a symposium on this subject which appeared in the January, 1939, issue of *Surgery*. There are a number of collaborators who assemble the present knowledge of the subject in very convenient form. The book is well illustrated and well indexed and has a complete bibliography. It should be useful both for the purpose of getting up to date information on the subject and also for reference.

GORDON C. MACRAE, M.D.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from Page 130)

he was born in Denmark in 1863, and that he has been in this country forty years. He holds no license to practice any form of healing in the State of Minnesota, and stated that he has a diploma in mechano-therapy from the American College of Mechano-Therapy at Chicago, dated November 18, 1908. He has lived in Minneapolis for about twenty years and has represented himself to the public as a naturopathic physician. At the time of his arrest he was representing himself as a physiatric specialist in women's ailments. Prior to residing at the Humboldt Avenue address, Visholm practiced at Portland and Lake Streets and at 1700 West Lake Street. Visholm, when questioned by Judge Reed about practicing without a license, stated to the Court that the naturopaths had attempted on four occasions to have naturopathy recognized by the Minnesota Legislature, but that the bill had been defeated each time.

The Minnesota State Board of Medical Examiners approves of the disposition made of this case due to the defendant's advanced age, and because of his frankness in acknowledging his guilt at the time of his arrest, and other circumstances connected with the case. The Medical Board also wishes to acknowledge the very prompt and splendid work done in this case by the Women's Bureau of the Minneapolis Police Department, and particularly by Lieutenant Blanche Jones, head of the Bureau, and Mrs. Carrie Bystrom and Miss Gladys Cooke, policewomen.

MINNESOTA MEDICINE